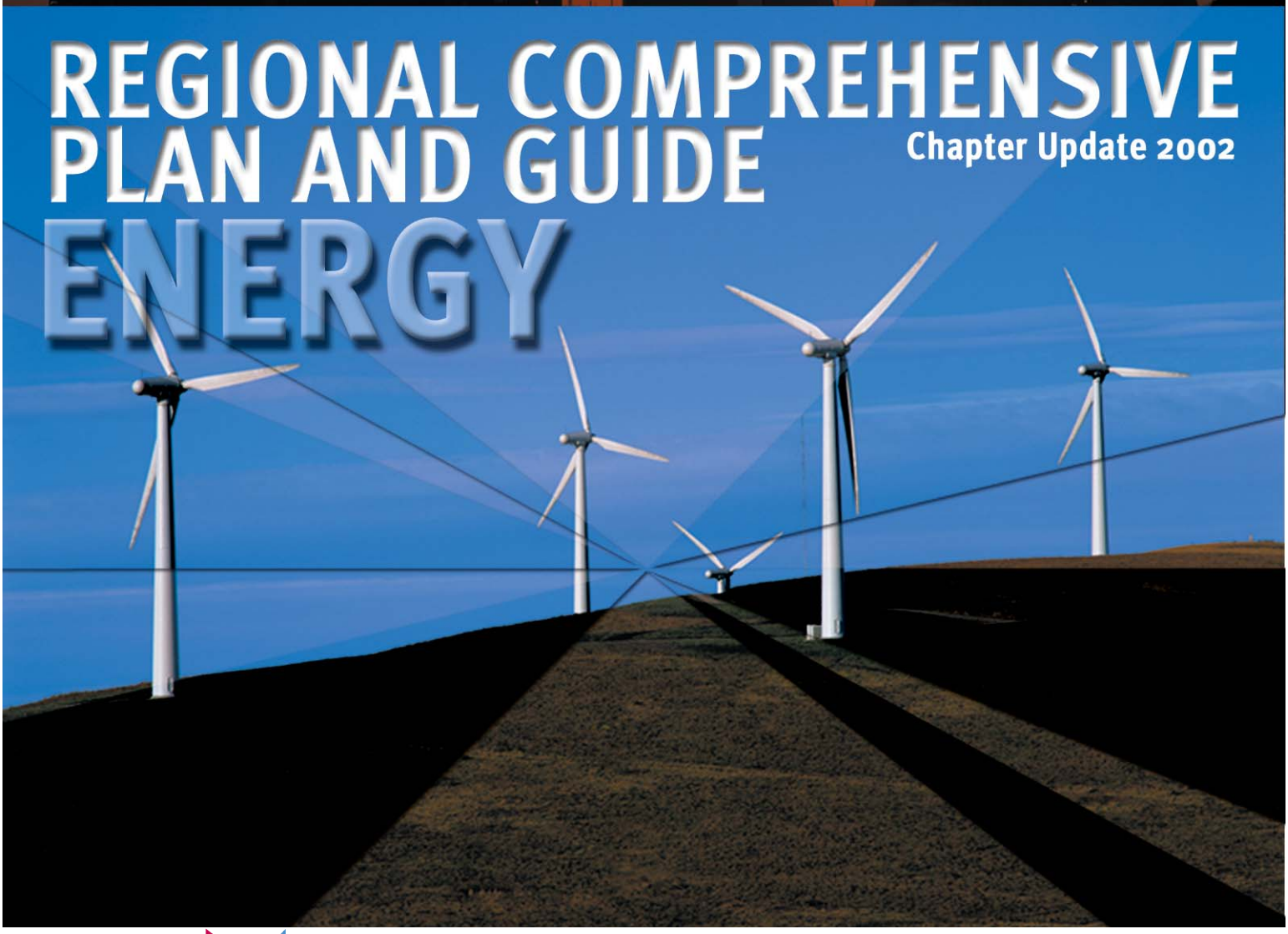
REGIONAL COMPREHENSIVE PLAN AND GUIDE

Chapter Update 2002

ENERGY



SOUTHERN CALIFORNIA **ASSOCIATION** of **GOVERNMENTS**

1555 9/02

ENERGY
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List of Abbreviations and Acronyms

AB – Assembly Bill
ABAG – Association of Bay Area Governments
BGP – Burbank, Glendale, and Pasadena
CA – California
CADER – California Alliance for Distributed Energy Resources
CARB – California Air Resources Board
CEC – California Energy Commission
CEERT – Center for Energy Efficiency and Renewable Technologies
COG – Council of Governments
CHP – Combined heat and power
CO – Carbon monoxide
CPA – California Power Authority
CPUC – California Public Utilities Commission
DCA – Department of Consumer Affairs
DG – Distributed Generation
DER – Distributed Energy Resources
EE – Energy Efficiency
FERC – Federal Energy Regulatory Commission
HOV – High occupancy vehicle
IID – Imperial Irrigation District
IRP – Integrated Resource Planning
IOU – Investor-owned utility
ISO – Independent System Operator
LADWP – Los Angeles Department of Water and Power
MTBE – Methyl tertiary-butyl ether
MW – Megawatt
NAFTA – North American Free Trade Agreement
NREL – National Renewable Energy Laboratory
NOx – Nitrogen oxides
PG&E – Pacific Gas & Electric
PM – Particulate matter
POWER – Preserve Our Widely used Energy Resources
PURPA – Public Utilities Regulatory Policies Act
QF – Qualifying facility
REEI – Regional Energy Efficiency Initiative
REO – Regional Energy Office
ROG – Reactive organic gases
RCP & G – Regional Comprehensive Plan & Guide
RTP – Regional Transportation Plan
SANDAG – San Diego Association of Governments
SB – Senate Bill
SCAG – Southern California Association of Governments
SCAQMD – South Coast Air Quality Management District
SCE – Southern California Edison
SCPPA – Southern California Public Power Authority
SOx – Sulfur oxides
TEOR – Thermally enhanced oil recovery
TOG – Total organic gases
VMT – Vehicle miles traveled

Executive Summary

The Southern California Association of Governments (SCAG) adopted a Regional Comprehensive Plan & Guide in the mid-1990s. The Guide included a non-mandated chapter on energy resources in the region. This document represents an update to that chapter, which was supplied by the California Energy Commission and covered electricity, natural gas, and petroleum (transportation fuels).

Since the mid-1990s, much has changed in the state's and the nation's energy picture. At the national level, there is renewed interest in energy security following the terrorist attacks of September 2001. In California, the state continues to struggle with the fiscal impacts of a largely unsuccessful attempt, starting in 1998, to deregulate the electricity market. Temporarily tight natural gas supplies contributed to the electricity "crisis" the state experienced from mid-2000 through early 2001. In response to 2000 legislation, the state is also seeking ways to reduce dependence on petroleum as a transportation fuel.

In the SCAG region, electricity demand increased 16% during the 1990s, and is projected to continue to grow at about 2% per year, roughly keeping pace with projected population growth. Natural gas demand grew more steeply, increasing 35% during the 1990s. This growth is attributed to fuel switching from oil to cleaner-burning gas in response to stricter air quality standards. Less dramatic demand growth – approximately 11% overall – is projected for the next 10-20 years. Petroleum product demand in the region is expected to continue to grow 35-40% by 2025, roughly keeping pace with population growth and increases in vehicle miles traveled.

It is clear that energy use has dramatic environmental and public health implications, even though data is far from complete. Air pollution from mobile sources and stationary sources such as power plants has been linked to increased mortality and cancer risk. Fuel spills continue to foul beaches, waterways, soils, groundwater, and the ocean. Power plants use water and can affect wildlife habitats, as can other energy infrastructure.

The SCAG region can pursue alternative energy sources and energy conservation measures to serve a growing population without necessarily increasing energy use or cost. To accomplish

this goal, the region needs to undertake an integrated resource planning effort that takes into account the sources and external costs of energy. This type of planning will enable more informed energy policy decisions. At the same time, the region would benefit from supporting state efforts to develop energy goals so that local initiatives are more coordinated, and, ultimately, help provide reliable, secure, and safe energy at the lowest possible cost.

I. Introduction

Background

In 1996, the Southern California Association of Governments (SCAG) adopted a Regional Comprehensive Plan & Guide (RCP&G). This document incorporated a number of mandatory and voluntary regional plan elements. For example, it incorporated a summary of the Regional Mobility Element, a required plan element that met SCAG's obligation as a metropolitan planning organization to prepare a Regional Transportation Plan. Voluntary (non-mandated) chapters of the RCP&G included sections on public finance, water resources, open space and conservation, and energy.

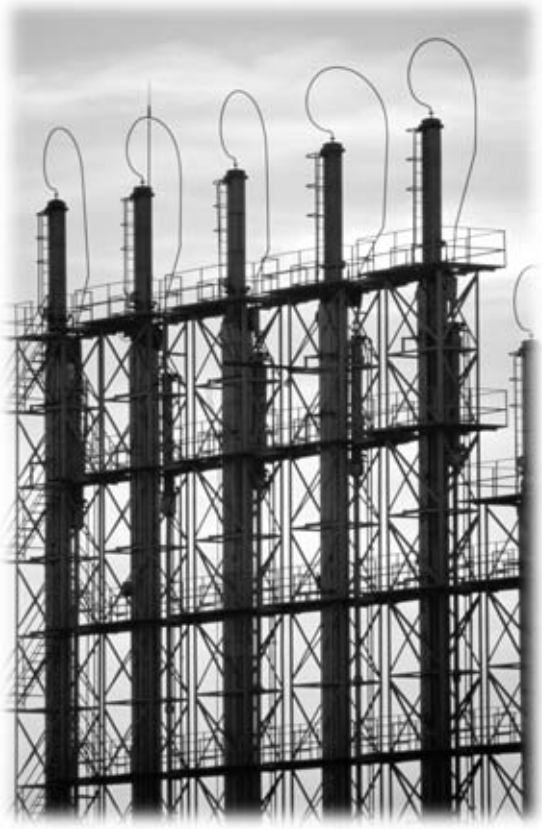
The energy chapter was written in 1994 by a team of consultants hired by the California Energy Commission (CEC), and was provided to SCAG staff for incorporation into the final document. The adoption date of the energy chapter was November 1994; the chapter's scope included electricity, natural gas, and petroleum (transportation fuels). A more complete summary of the prior chapter is given below.

Summary of the Prior Energy Chapter

The purpose of the original energy chapter was to provide regional and local decision-makers with an understanding of the pervasive role that energy plays in the Southern California economy, and to serve as a guide to energy efficiency opportunities that can be implemented by local and regional officials.

The chapter included a snapshot of electricity, natural gas and petroleum use in 1990 for the SCAG region. Energy use forecasts for 2000, 2010, and in some cases 2015 were also provided. Population and economic growth were the driving forces for increases in energy demand. From 1990 to 2010, the region's population was expected to increase over 40 percent, generating an increasing demand for energy. By 2010, regional peak demand for electricity was expected to increase by 44 percent and annual electricity use to increase by more than 40 percent over 1990 demand. Natural gas and petroleum product fuel use were likewise projected to increase, though at slower rates.

The chapter also identified environmental and infrastructure implications of this growing demand for energy. For example, data were presented on natural gas and petroleum combustion emissions of nitrogen oxides (NOx), sulfur oxides (SOx) and reactive organic gases (ROG). The infrastructure needed to accommodate growing energy demand included electricity generation



facility additions and repowerings, additional transmission lines and facilities and transportation network improvements.

The nucleus of the chapter was a comprehensive assessment of 18 local efficiency measures aimed to reduce costs, environmental impacts, and security risks associated with the growing energy demand in the SCAG region. These measures focused on four major areas: buildings and appliances, land use, movement of people, materials, and information, and infrastructure. The assessment provided an evaluation of the efficiency measures' impacts, including energy use and emissions avoided, and included implementation strategies.

Overall, the prior chapter contained useful information and analysis, but changing conditions and increasing uncertainty necessitate updating the chapter. Thus, the purpose of this Energy Chapter Update is to incorporate new information and to draw attention to the need for more certainty about the region's long-term energy supply and demand.

The Need for Updating the Energy Chapter

In September 2001, the nation came under attack by terrorists from the Middle East, one of the country's largest sources of imported petroleum.[1] This event, along with continuing unrest in that region, has helped to create new concerns about American dependence on petroleum and has renewed national interest in energy policy.

Much has changed in California's energy situation since the original chapter was written. For example, in the mid-1990s California joined many other states in deregulating its electricity market, though its experience has been among the least successful. The nation's and the state's natural gas markets continued to adjust to deregulation in the mid-1980s. New transportation technologies advanced to the point where alternative fuels are nearing cost-competitiveness with traditional fuels.

In 1996 the state legislature passed Assembly Bill 1890, restructuring the electricity market, and the law took effect in 1998. At first, the market seemed to be functioning well, but beginning in 2000, electricity demand began to catch up with supply. This combined with a number of other factors to produce price spikes and rolling blackouts. The state's responses to the power crisis have dismantled much of the deregulation effort and continue to have severe budgetary implications.

The restructuring effort has created additional challenges for energy planning. Largely as a by-product of market restructuring, less energy data is available and less planning is done, since in theory, market forces would have "planned" our energy supply and demand. Before AB 1890, the CEC and California Public Utilities Commission (CPUC) would collaborate in forecasting power demand and supply, i.e., licensing of new projects. They no longer conduct the same process, and the CEC's forecasts go only 10-12 years into the future, despite the fact that energy infrastructure can take longer than this to plan and develop. Even the investor-owned utilities have scaled back their energy forecasting efforts, though they still conduct business planning on various time horizons.

The chapter's scope also includes transportation fuels, and there is considerable uncertainty here as well. For example, petroleum price spikes are not uncommon in the California market. Furthermore, there is little agreement on forecasted adoption rates for alternative-fuel vehicles, but the progress of new transportation technologies – electric cars, hybrids, fuel cell vehicles – has substantial implications for energy demand, air quality, and transportation finance.

Another energy planning challenge is to consider the context of regional growth visioning. Energy infrastructure uses land; new land use (development) generates demand for electricity, natural gas, and transportation energy. Electricity planning by utilities, for example, cannot be expected to consider the full range of social, environmental, and economic costs of various growth scenarios – dispersed growth patterns vs. compact or transit-oriented development, or other approaches. Energy planning may be like water resources planning – involving costly infrastructure, public and private interests, and long planning horizons – with the added complication that electricity cannot be stored.

Scope of the Chapter Update

This chapter presents data on current electricity use (2000), natural gas use (2000), and petroleum fuel use (1997) for the SCAG region, as well as forecasted energy use as far in the future as projections are available.

Electricity use data were provided by the California Energy Commission (CEC), Southern California Edison, the Los Angeles Department of Water and Power, and the Southern California Public Power Authority. SCAG region electricity forecasts are presented for 2012, the latest year now available from the CEC (prior chapter forecasts went to 2015).

Natural gas use data were provided by the California Energy Commission and were also taken from the California Gas Report, a joint product of the state's natural gas utilities overseen by the California Energy Commission and the California Public Utilities Commission. Forecasts are presented for 2020, the latest year in the Gas Report.

Current (1997) and future projected (2025) petroleum fuel use are estimated based on vehicle miles traveled (VMT) as presented in the adopted 2001 Regional Transportation Plan (RTP). Additional transportation energy forecasts are presented for natural gas usage in vehicles, and there is a discussion of trends in transportation energy usage based in part on joint work by the CEC and the California Air Resources Board.

The energy efficiency analyses done for the prior chapter are still generally valid and are not repeated. The prior chapter is cited as a resource. New information is given about current energy efficiency efforts and priorities at the state and regional level, along with resources for further information to assist cities and counties in evaluating their options.

Continuing uncertainty in the California power market makes this update more difficult and its conclusions less reliable (or reliable only as a snapshot). These uncertainties in California's energy situation and the recent changes in the planning arena indicate a need for energy planning at the regional level. This type of planning can

- help identify whether energy demand will exceed supply in the region
- clarify trade-offs among the environmental, social and economic benefits and costs of various energy policies or choices
- identify and publicize energy efficiency opportunities
- help local jurisdictions design and implement energy policies
- enable informed regional decision making about energy policies.

Lastly, the development of this chapter update has proceeded with the assistance of a Regional Energy Advisory Group consisting of members from various public, private, and non-profit groups.

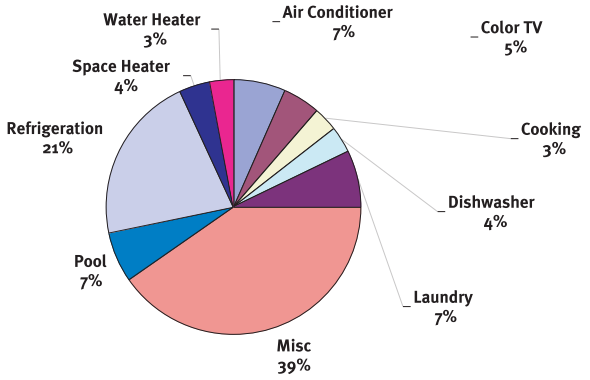
II. Current SCAG Region Energy Use

Energy is purchased because it provides an essential or desired service – personal comfort, transportation, light to see by. In 2000, SCAG region residents used electricity to provide energy services such as refrigeration (21% of residential electricity), washing laundry (7%), air conditioning (7%), and pool heating (7%; see Figure 1). Within the "miscellaneous" category, about half the power is consumed by lighting, and the remainder by other small household appliances. In the industrial and commercial sectors, lighting, motors, and cooling are the largest electricity users (see Figure 2), and are, thus, the best opportunities for energy efficiency.

Water and space heating represent the largest residential portion of natural gas energy services, using almost 2/3 of residential natural gas in the region (see Figure 3). In the industrial and commercial sectors, boilers and process heat are the two largest uses of natural gas (see Figure 4).

Figure 1

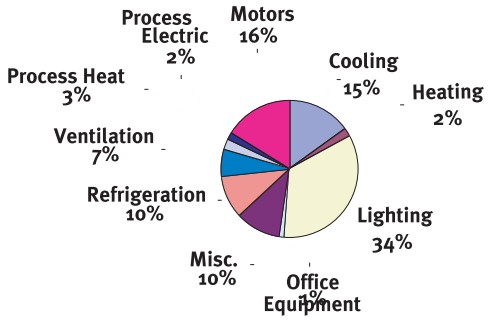
SCAG 2000 Residential Electricity Use



Source: CEC, California Energy Demand 2000-2012 Forecast, September 2001.

Figure 2

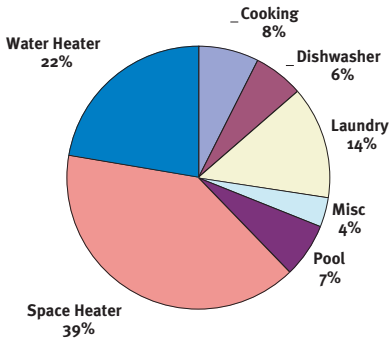
SCAG 2000 Industrial & Commercial Electricity Use (million kWh)



Source: CEC, California Energy Demand, 2000-2012 Forecast, September 2001.

Figure 3

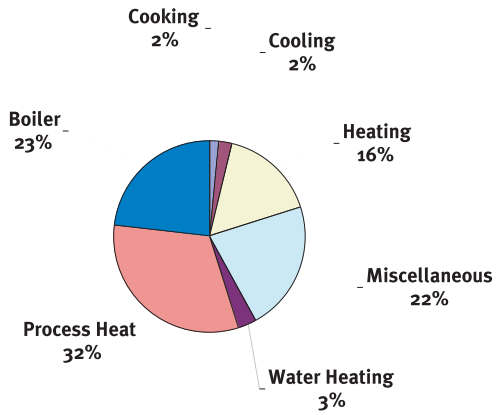
SCAG 2000 Residential Natural Gas Use



Source: California Energy Demand, 2000-2010, June 2000.

Figure 4

SCAG 2000 Industrial & Commercial Natural Gas Use
(million therms)



Source: CEC, California Energy Demand 2000-2012 Forecast, September 2001.

Electricity

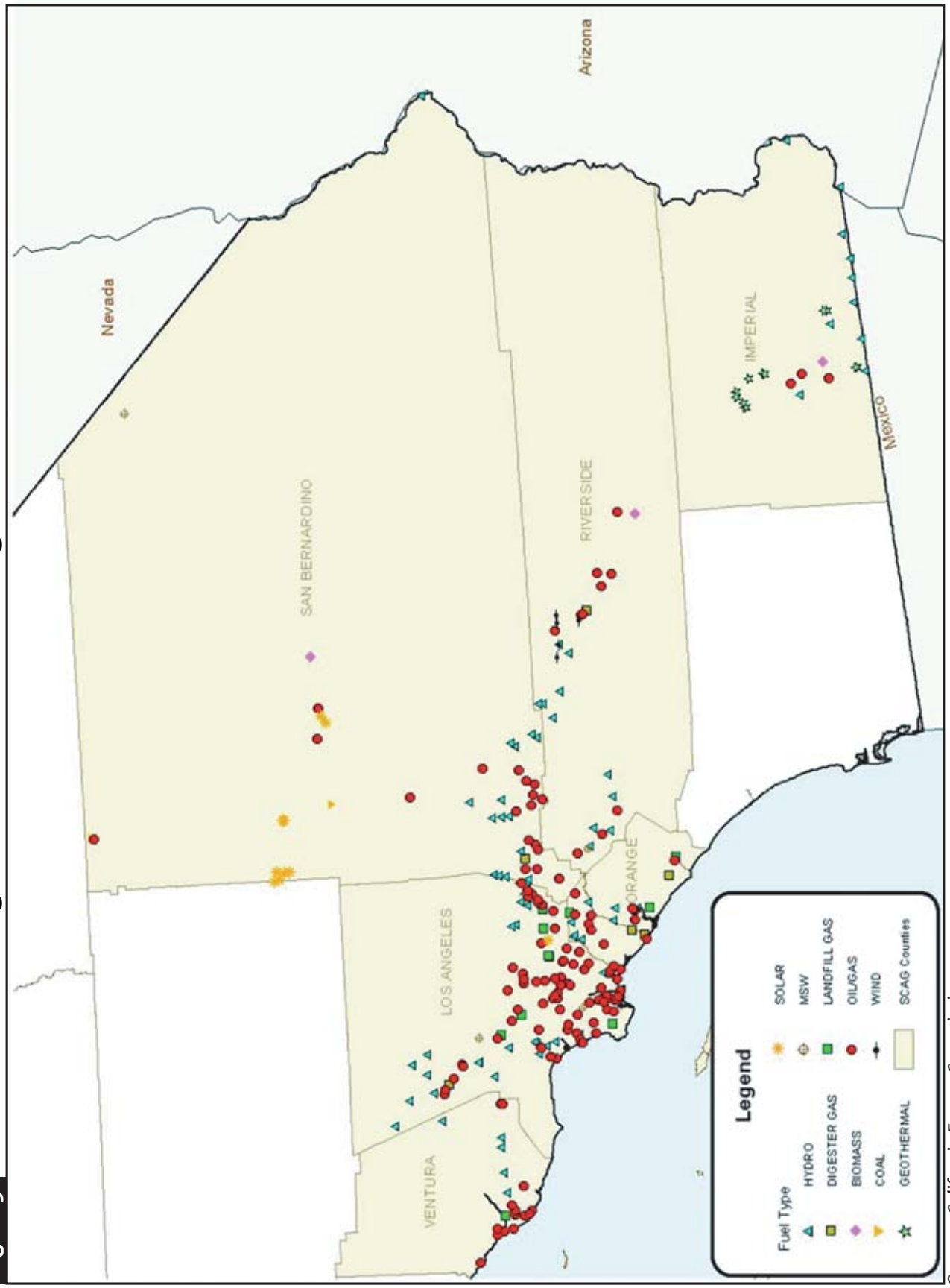
The SCAG region's electricity needs are served by both private and public utilities. Municipal utilities (see Table 1) provide about 35% of the power in the region, compared with only about 10% statewide. Southern California Edison, an investor-owned utility, serves most of the balance of the region.[2] Figure 5 shows the locations of the power generation facilities in the SCAG region, including all energy sources and technologies. Appendix A contains a table listing all the generating facilities in the SCAG region in order by county, then by primary fuel type.

Table 1. Municipal Utilities Serving the SCAG Region

	FY 2001: July 1 - Jun 30	
	Peak MW	**GWh**
LADWP	5,942	26,120
IID	711	3,008
City of Pasadena (Water and Power)	275	1,191
Glendale	300	1,150
Burbank	302	1,257
Riverside	470	1,900
Vernon	190	1,200
Anaheim	608	3,256
Azusa	55	250
Banning	37	126
Colton	72	345
Total	**8,962**	**39,803**

Source: Southern California Public Power Authority, 2/20/02

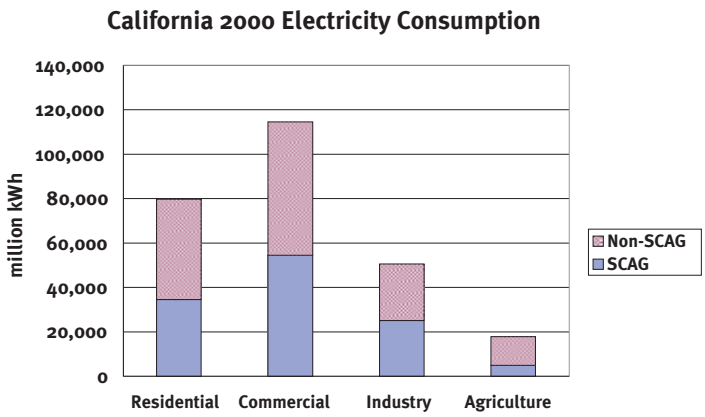
Figure 5 **Power Generating Facilities in the SCAG Region**



Source: California Energy Commission

As of 2000, the SCAG region's electricity usage totaled approximately 120 million kilowatt-hours (kWh) per year, about 45% of the statewide total usage of about 260 million kWh/year (see Figure 6). In 1990, by comparison, the region used just under 105 million kWh. In the SCAG region, and for the state as a whole, the commercial sector is the biggest electricity user and the agricultural sector the smallest.

Figure 6



Source: Quarterly Fuel and Energy Report

Since the prior energy chapter was written, California has become one of several states to restructure and partially deregulate its electric generation industry. As in other states, the goal was to provide more choice and lower cost for power consumers. For a variety of reasons, California's experience with restructuring has been largely unsuccessful. A flawed market design and concurrent demand growth were two major factors that contributed to power supply disruptions and sharp price increases in 2000 and 2001. In response, the state has suspended some of the market changes, at least temporarily.

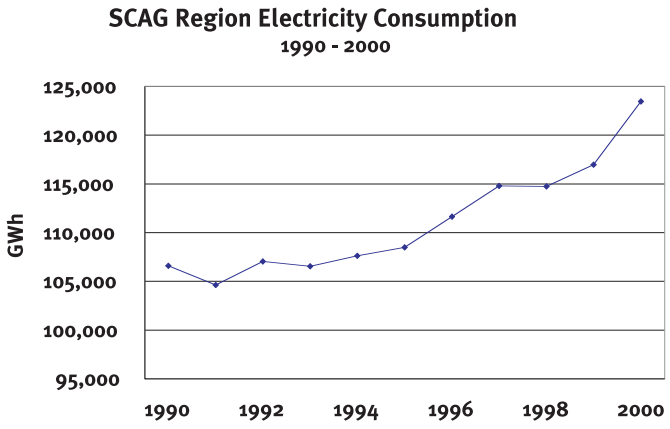
A brief discussion of California's energy deregulation experience follows, including its implications for the SCAG region. For a more complete analysis, refer to reports such as those by the Congressional Budget Office[3] and Resources for the Future[4] or to the California Energy Commission's Electricity Outlook Report[5] or other CEC reports.

Electricity Restructuring in California

California's restructuring law, most often referred to as Assembly Bill (AB) 1890, was passed in 1996 and began to take effect in 1998. In concept, it opened retail power sales to competition and divested most generation facilities from the investor-owned utilities. Transmission and distribution remained state-regulated. To smooth the transition to retail deregulation, retail power prices were capped until the investor-owned utilities (IOUs) had recovered certain stranded costs associated with implementing the new law. Municipal utilities were not required to participate in the restructuring.

During the 1990s, power demand had been growing throughout California and the West, fueled by population increase as well as by growth in the economy and the boom in computer- and power-driven e-commerce. The SCAG region's growth in power demand was similar to that of the state as a whole; it reflects the somewhat later easing of the early 1990s recession in this area, beginning to rise only after 1995 (see Figure 7). While demand grew, little new generation was being built in the state, possibly due in part to uncertainties arising from the state's imminent restructuring. Power reserves began to shrink.

Figure 7



Source: California Energy Demand Forecast, Sept. 2001

In mid-2000, San Diego Gas & Electric became the first of the state's three IOUs to recover its costs and move to unregulated retail rates. Prices in its service area tripled that summer, thanks in part to an increase in natural gas prices and a concurrent dry spell in the region, which caused a shortage of inexpensive hydropower in the western states.

Problems with power supply cost and reliability were not, unfortunately, limited to San Diego. By the end of 2000 and into the beginning of 2001, the state's power reserves frequently dwindled to levels where the California Independent System Operator (ISO) was forced to call alerts at Stage 1 (real-time reserves below 7%), Stage 2 (reserves below 5%), and even Stage 3 (reserves below 1.5%).[6] The ISO declared one Stage 3 alert in December 2000 and 38 more in 2001, nearly all in January and February of that year.[7] The state experienced rolling blackouts on six occasions in early 2001, though most were in Northern California.

The California power crisis, as it came to be known, was even more surprising since it occurred in winter, normally not the season in which power demand peaks in the state. It is, however, frequently the season in which generating units are taken off-line for maintenance. The parts of the state most acutely affected by these problems were outside the SCAG region: in particular, San Diego and portions of the Bay Area are dependent on inadequate transmission lines to bring in power, and suffered the majority of actual power outages. However, the San Gabriel Valley was also affected by power outages.

Along with a tightening of supply came an increase in price. Under the restructured market, the IOUs were expected to buy power from independent generators and could not enter into long-term contracts to buffer spot price fluctuations. In late 2000 and early 2001, prices rose to the point where the IOUs experienced difficulty maintaining creditworthiness. With retail prices still capped, but wholesale prices soaring to $200/MWh and more, Pacific Gas & Electric declared bankruptcy in April 2001. Southern California Edison neared bankruptcy as well, but avoided it by structuring a deal with the Public Utilities Commission that took advantage of descending prices in the summer of 2001.

The state legislature reacted to the power crisis by convening two extraordinary sessions and enacting several measures to encourage energy efficiency, particularly peak demand reductions. One of the most notable of the laws, AB 970, established several new state-funded renewable energy and energy efficiency programs (see Section V for a more detailed discussion). The state also rolled back some of the restructuring law's retail price controls, and appealed to the Federal Energy Regulatory Commission (FERC) to impose caps on wholesale prices. The FERC imposed a partial cap in 2000, but exceptions allowed prices to continue to rise, and the agency imposed a stricter cap in June 2001.[8]

To assist the state's struggling IOUs, who could not borrow the funds to buy power, the Governor empowered the state Department of Water Resources to buy power on their behalf. Power purchase contracts negotiated during the first months of 2001, however, often reflected the still very high short-term prices for power. The state continues to struggle with the budget impacts of these power purchase contracts, even as consumers may be relaxing their energy efficiency efforts as prices subside. State and federal officials are investigating whether independent energy producers manipulated supply to drive up prices, and California officials have sought a refund of up to $9 billion in energy charges from the early part of 2001.

Another state response to the energy situation was to create a new public power authority, the California Consumer Power & Conservation Financing Authority, in mid-2001. The CPA, as it is called, was envisioned as a "fire wall between energy instability and energy self-sufficiency."[9] Its legislative mandate is to furnish the citizens of California with reliable, affordable electric power, to ensure sufficient reserves, and to encourage energy efficiency, conservation, and the use of renewable resources. The CPA has produced an Energy Resource Investment Plan that describes financing for clean energy, strategic reserves, and "greening" public buildings' energy use.[10]

The CEC's Electricity Outlook Report projects that the state's power market may encounter reliability and price stability problems in the long term if the budget issues and the current market structure are not addressed.[11]

As noted above, a substantial portion of the SCAG region is served by municipal utilities. These utilities were not required to divest assets or otherwise participate in the restructuring program, and this served the SCAG region well. The LADWP in particular was able to serve its customers without interruption, and even sold power to the state. Of course, the continued stability of Southern California Edison is still critical to a majority of the region's residents, and it remains in the region's interest to have a stable, predictable, and reliable price and supply of power.

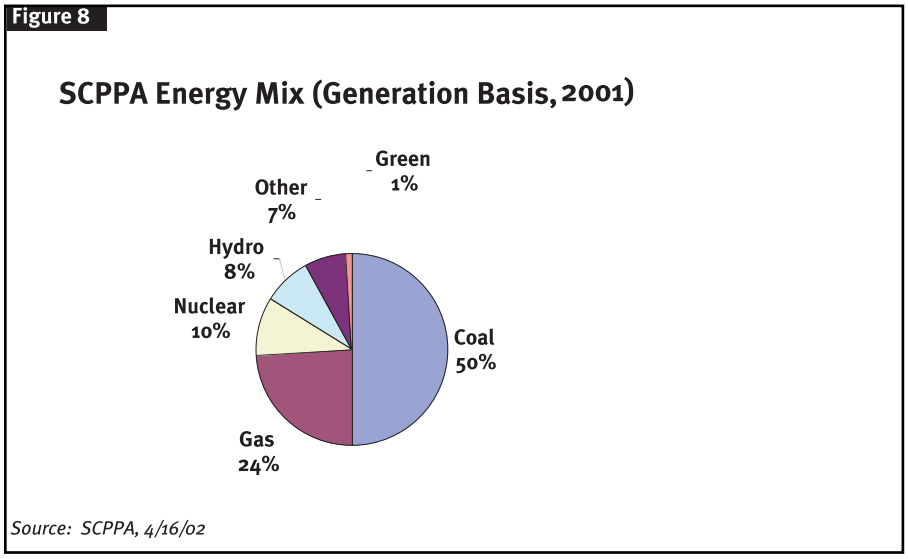
Energy Sources

The reliability of electricity supply depends, in part, on where the energy comes from. The greater the diversity of energy sources, the greater the reliability. In recognition of this fact, Congress passed the Public Utilities Regulatory Policies Act (PURPA) in 1978. PURPA was the nation's first attempt to encourage non-utility power generation and alternative energy, particularly in the wake of the 1970's national energy crisis. The act defined "qualifying facilities" (QFs) as those that used alternative or renewable energy sources, provided financial incentives for their installation, and required utilities to sign long-term power purchase contracts with QFs. The CPUC also adopted contract incentives to assist QFs.

Facilities built in the SCAG region in response to this act include wind and solar installations in Riverside and San Bernardino Counties, as well as a number of cogeneration units around the region. Original provisions of PURPA also encouraged the construction of biomass-to-energy facilities, which use materials such as agricultural and wood waste as fuel for energy production. However, changes to the law in the mid-1990s sharply reduced the number of biomass-to-energy facilities in the state and the amount of power they provide.[12] The CEC identifies only three biomass-to-energy facilities in the SCAG region today.

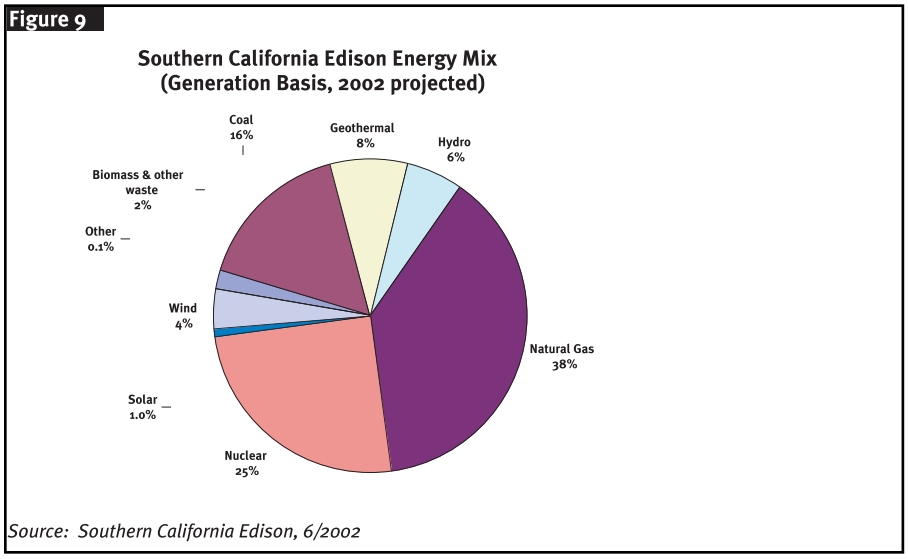
Conventional fossil-fuel power plants still provide most of the SCAG region's power, with coal and natural gas being the two most common fuels. In the aggregate, the region's municipal utilities, according to data from the Southern California Public Power Authority, provide a much larger portion of electricity from coal than does Southern California Edison (see Figure 8 and Figure 9). According to projected 2002 figures, Edison's largest sources of energy are natural gas (38%) and nuclear power (25%). Equal portions of Edison's power come from coal (16%) and renewables (16%). The SCPPA resource mix is largely due to the overwhelming contribution of LADWP (see Table 1), whose coal-fired plants provide about 50% of the utility's power but are located outside California.

Figure 8



Source: SCPPA, 4/16/02

Figure 9



Source: Southern California Edison, 6/2002

Deregulation is another factor in the availability of energy from alternative sources. Providing consumers with a choice of power sources from independent power producers was, of course, one goal of the state's restructuring effort. During the first few years of restructuring, "green" power suppliers from all over the country marketed power, often at slightly higher rates, to California customers. However, these private retailers withdrew as the market slipped into chaos.

Of the municipal power suppliers, the Los Angeles Department of Water & Power has been the most aggressive in marketing renewable power through its "Green Power for a Green LA" program.[13] As of May 2000, 45,000 customers had signed up for the program, which provides power from sources such as biomass and geothermal. The Department's 2000 Integrated Resource Plan adopts a policy of environmental leadership (on an equal footing with reliable service and competitive price) and envisions providing 150 MW of "green" power by the plan horizon year of 2010.[14]

According to Southern California Edison's website, one-third of the power sold in its service territory (much of which coincides with the SCAG region) comes from QFs (see Table 2).

Table 2. Southern California Edison Energy from Qualifying Facilities

Technology	MW Under Contract
Biomass	256
Cogeneration	2,299
Geothermal	763
Small Hydro	98
Solar	379
Wind	1,138

Source: SCE website, Regulatory Info Center, Qualifying Facilities, Renewable and Alternative Technologies

If California resumes its move towards deregulation, consumers may once again enjoy a broader choice of energy sources. At the same time, predicting where actual energy supplies come from will be more difficult as even large providers like Edison buy power on the open market.

As the foregoing figures show, relatively little of the SCAG region's electricity comes from truly renewable sources. For Edison in 1999, wind provided 5% of capacity, geothermal and biomass each 2%, and solar less than one percent of capacity. The municipal utilities, according to SCPPA, provided only 1% of energy from renewables in the most recent fiscal year. The California Power Authority cites a recent study by the Electric Power Research Institute that "centralized" renewable power (large installations at the energy source) could provide power for as little as 6.9 cents/kWh, a competitive price with conventional power sources.[15]

The state has considered adopting a "renewable portfolio standard" that would call for a certain percentage of electricity to come from renewable sources, but as of this writing, no standard has been adopted in legislation. Governor Gray Davis has expressed support for increasing California's share of renewable energy to 17% by 2006, as well as for proposals to set a renewable standard up to 20%.[16] In early 2002, a coalition of environmental and consumer groups put forward a proposal to renegotiate some of the state's power purchase contracts so as to increase the share of power coming from renewable sources from under 2% to 15-20%, among other goals.[17]

Distributed Generation

A closely related approach to energy reliability – and quite possibly to environmental improvement – is distributed generation (DG), also referred to as distributed energy resources (DER) or self-generation. Definitions of DG or DER vary, making it difficult to accurately characterize the extent of its use. The California Energy Commission has defined distributed generation to mean "electric generation connected to the distribution level of the transmission and distribution grid usually located at or near the intended place of use."[18] Self-generation refers to systems owned by the customer and installed on their side of the meter to supply power on site. Often, demand-side management (DSM) measures are included in consideration of distributed generation.[19] DG can cost-effectively displace or delay the need for new electricity infrastructure.

DG contributes to energy reliability and energy security. Power users who can generate their own power are less dependent on the central grid, and can reduce peak load at times of high demand. DG users are thus less vulnerable individually to system-wide outages. Furthermore, distributed energy resources reduce the importance of large, central power generating stations that could make potential targets for terrorists. Similarly, they also can reduce the vulnerability of the power transmission and distribution system.

Depending on the type of technology, distributed energy resources may also provide environmental benefits, potentially regionally as well as locally. This is particularly true of photovoltaic (solar) installations, wind turbines, and fuel cells. Biomass-to-energy facilities can also result in reduction of environmental impacts relative to other means of organic waste disposal. Even though microturbines are often fossil-fuel-fired, the latest systems are very low-emitting. Several have been placed around the SCAG region in biomass applications (using landfill gas) in projects funded by the SCAQMD.

Distributed generation installations can also provide opportunities to improve resource efficiency through waste heat recovery. Another term for this practice is "combined heat and power" (CHP), also referred to as cogeneration, which simply means the capture of useful thermal energy at the same time electrical power is produced. This practice can increase the efficiency of energy production from approximately 33% to over 70%, with clear environmental benefits.[20] While CHP need not necessarily be applied in conjunction with DG, it is integral to the design of systems referred to as micro- or mini-grids or power parks: a local cluster of power generators and users (residential, industrial, or otherwise) with a single connection to the main power grid. This model, also called district power, was once common in municipal power generation and is enjoying renewed interest by the U.S. Department of Energy,[21] the CEC, and DG advocates.

A small portion of the SCAG region's electrical power is currently provided by distributed energy resources. According to the California Energy Commission's Distributed Generation Strategic Plan, there are over 500 installations totaling 766 MW of operational DG in Southern California Edison's territory, with another 215 MW proposed.[22] The LADWP 2000 Integrated Resource Plan identifies an additional 4 MW of DG "projected for" 2001, consisting of 1 MW of fuel cells and 3 MW of photovoltaics.[23] No further data is available on the extent of distributed energy resources in the SCAG region: for example, in other municipal utilities' service areas. The Office of Ratepayer Advocates (within the Public Utilities Commission) is collecting data for future publication.

The limited use of DG in the SCAG region reflects a number of barriers that have slowed the adoption of DG nationally. According to the National Renewable Energy Laboratory, barriers include the following:

- Relatively small projects may face high fees, long approval processes, or burdensome insurance requirements. An example is high backup or standby charges, which a utility collects to cover the cost of providing power when the DG system is not operating. Another is exit fees, which are levied on customers leaving the grid to compensate the utilities for the stranded cost of generating facilities.
- There is no national consensus on standard interconnection practices, so each project must go through a unique process, pay different charges, and meet different technical and safety standards. This may partly reflect utilities' lack of experience with DG projects, but could also stem from an understandable reluctance to lose part of their customer base.
- There is often no way to recognize the environmental or social benefits of DG projects – an important lack of incentive.[24]

The California Public Utilities Commission, through a current rulemaking process, has modified provisions of its Rule 21, which governs utility tariffs. In particular, "[i]n order to ensure that unnecessary barriers to deployment of distributed generation are removed, the Commission adopted standards to simplify and standardize interconnection requirements and associated fees governing interconnection of distributed generation facilities."[25] Perhaps in anticipation of the removal of some of these barriers, the LADWP envisions installing 70 MW of DG by 2010.[26]

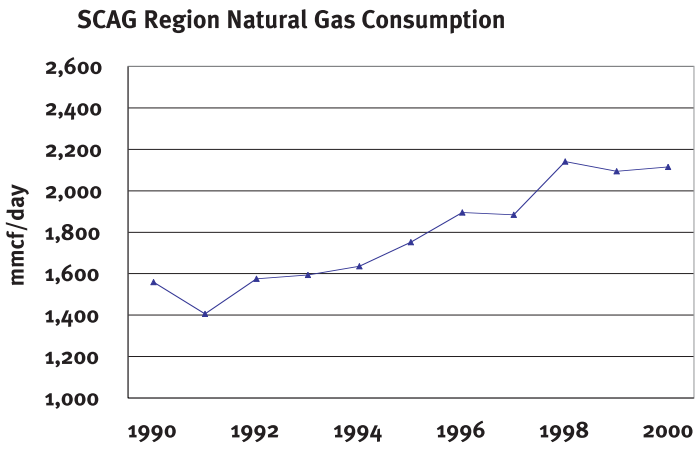
Since many DG technologies, such as wind and solar, take advantage of essentially free energy sources, the main installation barrier is the capital cost of equipment. A number of state programs have been established to facilitate the installation of DG, including self-generation, including buydowns for up to 50% of the cost of equipment depending on the type of technology.

Natural Gas

Natural gas supply and demand figures are tracked and compiled by the state's natural gas utilities in the annual California Gas Report. The SCAG region is served primarily by the investor-owned Southern California Gas Company, a unit of Sempra Energy. A small portion of the region is served by a municipal gas utility, Long Beach Energy (part of the City of Long Beach); this utility supplies about 1.5% of the gas in the region.

Like electricity demand, natural gas demand has increased substantially in the SCAG region over the last decade (see Figure 10; note that these data do not include natural gas burned for electricity generation). The average annual growth rate was 3.6%; the overall increase between 1990 and 2000 was 35.6%, probably reflecting fuel switching from oil to gas in response to stricter air quality regulations.

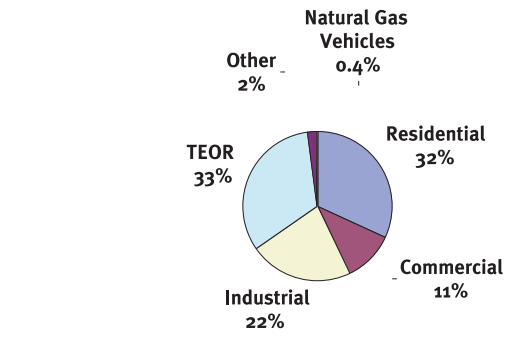
Figure 10



Source: Southern California Edison, 6/2002

Excluding natural gas used to generate electricity, residential gas usage in the SCAG region is about equaled by gas usage in thermally enhanced oil recovery (TEOR) operations, where heat is used to improve pumping of viscous petroleum from production fields (see Figure 11). Natural gas vehicles (see next section) represent a tiny fraction of the region's natural gas usage, but this use of natural gas is expected to grow dramatically in the next decade, particularly as heavy-duty vehicles transition away from diesel fuel.

Figure 11



Source: California Energy Commission

A short-term squeeze in California gas supply was a contributing factor in the electricity crisis that began in 2000. Pipelines were near capacity and little new gas production had been undertaken during the 1990s. As power demand grew in mid-2000, California utilities had little gas reserve storage, and were forced to pay high spot prices. During 2001 additional storage capacity has been added to alleviate the risk of repeating this experience. However, national gas market experts speculate that there still may be shortages in the nation's (and possibly the region's) future.[27]

Petroleum

Data from the Energy Information Administration of the U.S. Department of Energy indicate that 86% of California petroleum use is for transportation. While SCAG regional figures were not available, it is likely that the predominant use of petroleum in the SCAG region is likewise for transportation, as was the case in the prior energy chapter. Based on the SCAG 2001 Regional Transportation Plan, the SCAG region consumed 16,687,890 gallons/day of petroleum fuels in 1997, including gasoline and diesel fuel for light, medium, and heavy-duty on-road vehicles (see Table 3). This fuel was consumed in driving 346,292,865 vehicle miles per day, also according to the 2001 RTP. SCAG's share of statewide fuel consumption was somewhat smaller than its share of statewide VMT, indicating that SCAG's overall vehicle fleet is more fuel-efficient than the statewide fleet.

Table 3. SCAG Region Transportation Energy Use, 1997

Vehicle Fuel Consumption (gal/day)	
CA*	42,641,096
SCAG	16,687,890
SCAG Percentage	39.1%
Vehicle Miles Traveled (miles/day)	
CA*	780,336,986
SCAG	346,292,865
SCAG Percentage	44.4%

** California Department of Transportation, CA Motor Vehicle Stock, Travel and Fuel Forecast, 1998 report.*

III. Forecasted SCAG Region Energy Use

Strong population and economic growth continue to be forecasted for the SCAG region, meaning that energy demand will likely continue to increase as well. SCAG forecasts that population will increase 1.4% annually between now and 2025, due to a combination of natural increase and domestic and international in-migration. Natural increase is expected to contribute about 80% of the growth. The regional population in 2025 is currently forecasted to be 22.6 million residents, up from 16.5 million in 2000. These new residents will establish over 2 million new households.[28]

Employment growth will also continue, but as the SCAG region's population ages, job growth will be less dramatic than in the last quarter-century. The former annual employment growth rate of 2.5% will be replaced with a somewhat slower annual rate of 1.5%, but even at this rate, the region will grow to 10 million jobs in 2025 (from 7 million in 1997). The trend towards service jobs and away from manufacturing jobs may also slow the growth in demand for energy in the industrial and commercial sectors, though growth is still projected.

Despite the inevitable demands of growth on the region's energy supplies, little energy forecasting is formally conducted. Processes that formerly occurred at the state level, particularly for electricity demand forecasting, are no longer conducted in a restructured California market. Municipal utilities conduct their own planning processes, but do not coordinate their forecasts with each other or with those of the private utilities. There is no longer a coordinated process for planning maintenance on power generation facilities, creating a higher risk of outages even when demand is typically low.[29] Moreover, virtually every forecast incorporated into this report contained a disclaimer that the future is very uncertain.

At one time, state agencies conducted integrated resource planning (IRP), a process that "integrat[es] a broader range of technological options, including technologies for energy efficiency and load control on the 'demand-side,' as well as decentralized and non-utility generating sources, into the mix of potential resources. Also, it means integrating a broader range of cost components, including environmental and other social costs, into the evaluation and selection of potential technical resources."[30]

As the SCAG region faces the challenges of meeting its energy demands, we should consider undertaking an IRP process. According to the foreword to the United Nations Environment Programme's Integrated Resource Planning manual, energy efficiency and conservation are the tools by which economic growth can be "delinked" from energy consumption, allowing growth in gross regional product without an increase in energy usage.[31] In other words, while the population and economic growth may be inevitable, the growth in energy use does not have to be.

Energy infrastructure planning takes time, and therefore should be the subject of well-structured long-range planning efforts. As the energy grid evolves, former divisions between transportation energy, natural gas and electricity may begin to fade away. Some new vehicles run on electricity; some run on natural gas. New hybrids run on electricity and gasoline together. Fuel cell cars of the future could burn hydrogen, then plug in and send power to the grid when not on the road. As these technologies converge, the region needs to plan for the needed transportation and energy infrastructure while using its limited land resources efficiently and continuing to improve air and water quality. Our land use decisions continue to determine our regional demand for energy to heat and cool our homes or to travel to and from work.

Through its Energy Resource Investment Plan, the California Power Authority is taking steps to resurrect the IRP process. The plan lays out an approach for assuring sufficient power reserves by 2006 with only "clean power" investments – energy efficiency, peak load management, "clean" distributed generation and renewables – and no new power plant construction, which it terms a "business as usual" approach. The plan demonstrates lower costs and greater benefits from the "clean power" approach, based on a broad range of environmental, economic and social criteria.[32]

Electricity

Given the recent history of California's electricity market, concern has focused on whether short-term imbalances of power supply and demand will continue. Whatever the causes of the shortages and blackouts that faced the state in 2000 and 2001, most experts seem to agree that statewide energy reserves continue to be too slim.

The California Energy Commission has estimated peak and total electricity consumption for the SCAG region up to 2012, broken out by major service providers (see Table 4). While the statewide electricity forecast includes several future electricity consumption scenarios, no such analyses have been done for the SCAG region. The state's scenarios assume various levels of persistence of voluntary power demand reductions and various levels of growth in the impact of demand reduction programs. The SCAG figures in Table 4 are based essentially on a "business-as-usual" scenario, which assumes that the conservation measures undertaken in the summer of 2001, whether voluntary or programmatic, have no future effect.

Table 4. Projected SCAG Region Electricity Use

Plan Area	2000	2012
	Electricity Consumption (GWh)	
SCE*	96,050	121,452
LADWP	24,115	27,487
BGP**	3,281	3,714
Region	123,446	152,653
	Peak Demand (MW)	
SCE*	18,724	24,960
LADWP	5,031	5,808
BGP**	842	902
Region	24,597	31,670

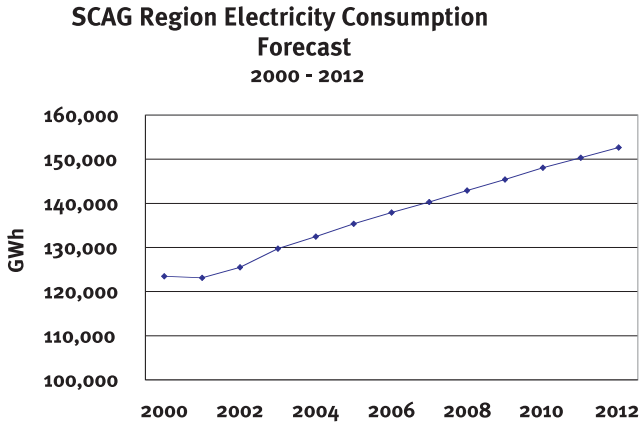
Source: California Energy Demand 2002-2012 Forecast, September 2001

** SCE figures include forecasts for other municipal utilities besides LADWP, Burbank, Glendale, & Pasadena. SCE service territory includes some areas outside the SCAG region.*

*** Burbank, Glendale, & Pasadena power utilities.*

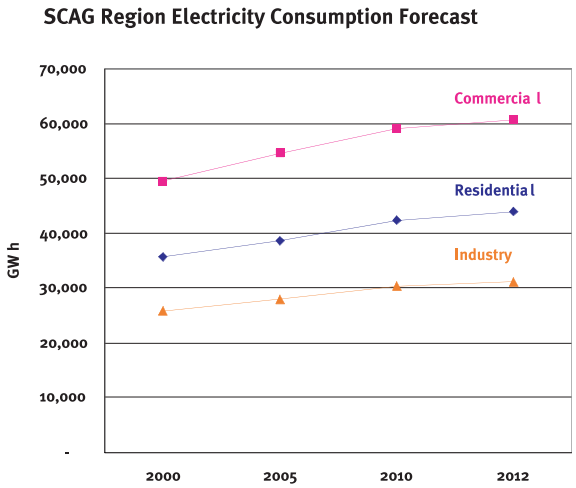
Due to energy crisis response, SCAG region energy usage actually dropped by 0.3% between 2000 and 2001. However, in the base case, the CEC projects that overall electricity demand will grow by 2% per year between now and 2012 (see Figure 12). Growth in the commercial sector will slightly outpace growth in the residential sector (see Figure 13), and electricity use for electric vehicles, while small, is projected to increase quickly over the same period (see Figure 14). The growth assumptions for power use in electric vehicles are consistent with the forecasts developed jointly by the CEC and CARB in their process for reducing petroleum dependence (for more information, see section below on Petroleum).

Figure 12



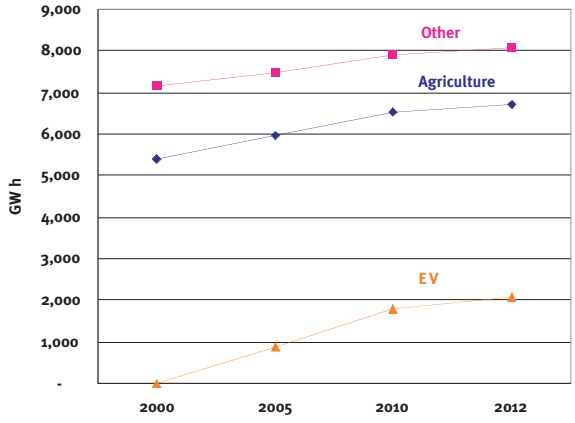
Source: California Energy Demand Forecast, Sep. 2001

Figure 13



Source: California Energy Demand 2002-2012, Sep. 2001

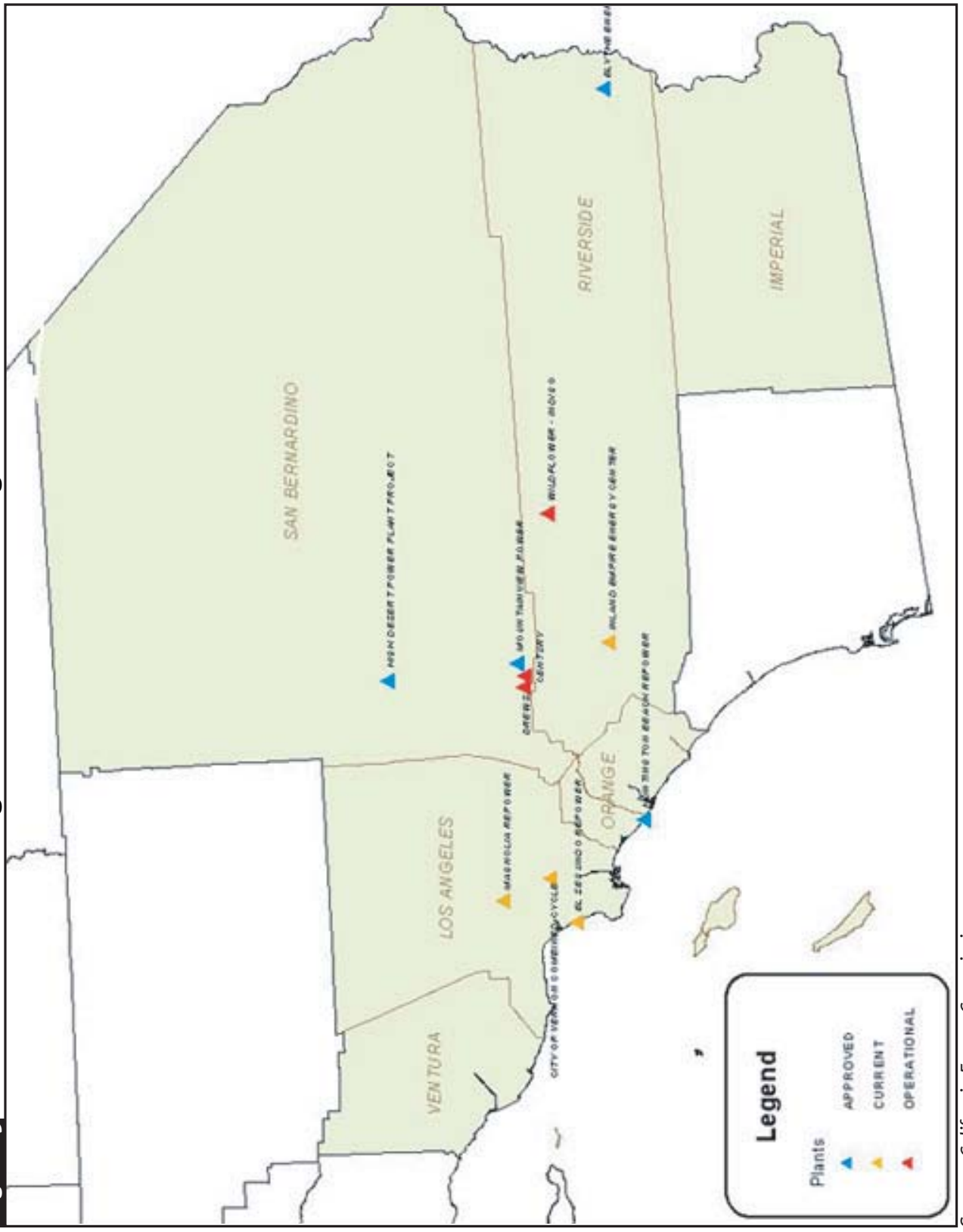
Figure 14



Source: California Energy Demand 2002-2012, Sep. 2001

More generating capacity is being built, both in the SCAG region (see map in Figure 15) and outside it. For example, Sempra Energy is building a 600-MW power plant in northern Baja California (not shown in Figure 15) that is expected to serve the California market, among others. Appendix B summarizes the licensing cases for new generating capacity in the SCAG region that are currently before the CEC.

Figure 15 Power Plant Licensing Cases in the SCAG Region

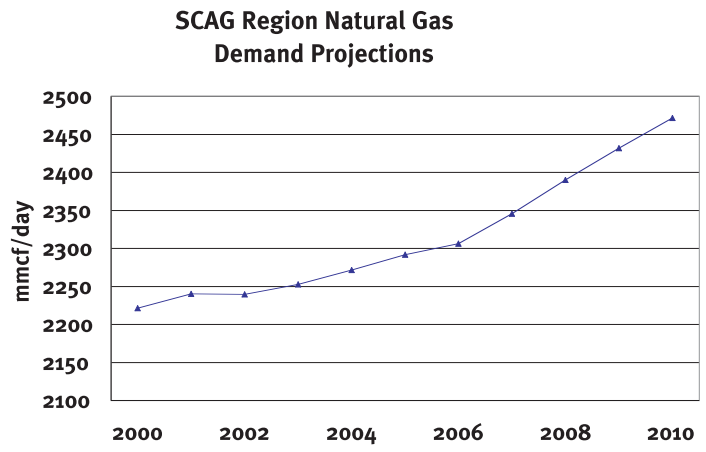


Source: California Energy Commission

Natural Gas

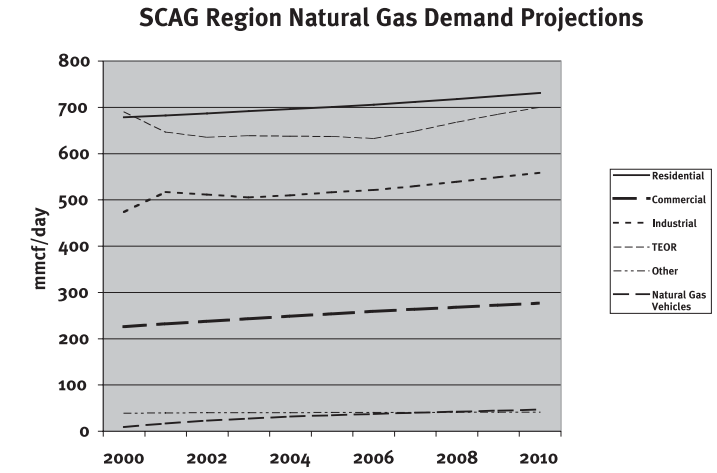
The California Energy Commission projects that natural gas usage will increase for the SCAG region between now and 2010 (see Figure 16). The CEC's projected annual average growth rate over this period is 1.1% per year. According to CEC's breakdown by sector, the steeper increases after 2005 will be driven mainly by gas use in industry and thermally enhanced oil recovery (TEOR), with some contribution from growing use of natural gas for transportation (see Figure 17).

Figure 16



Source: California Energy Demand 2000-2010, June 2000.

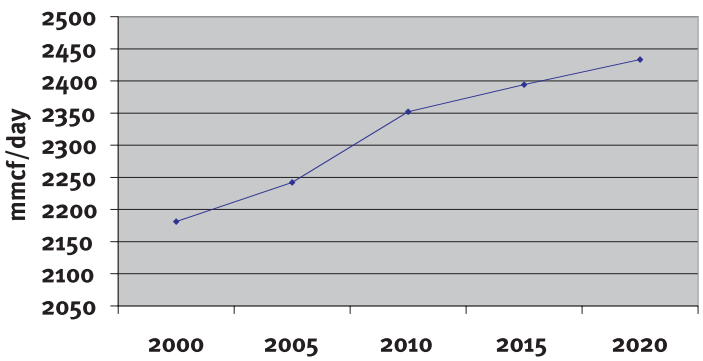
Figure 17



Source: California Energy Demand 2000-2010, June 2000.

The state's public and private gas companies collaborate to produce a longer-term forecast published in the California Gas Report (see Figure 18). This forecast is comparable to that of the CEC, except that the gas companies foresee demand growing more slowly, reaching the CEC's 2010 forecast demand in 2020.[33] The California Gas Report forecasts an average annual growth rate of only 0.8% between 2000 and 2010, and only 0.6% between 2000 and 2020. The California Gas Report forecast includes data for some portions of the Southern California Gas service territory that lie outside the region, specifically in Santa Barbara, San Luis Obispo, and Fresno Counties.

Figure 18

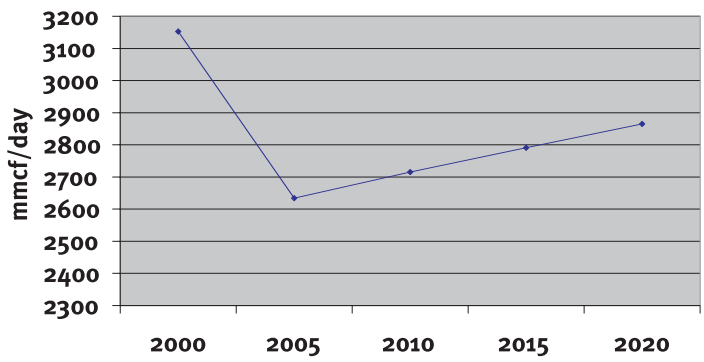


Source: 2000 California Gas Report (2000 data from California Gas Report 2001 Supplement)

The CEC does not include natural gas used for power generation in its figures and forecasts, while the Gas Report does include this data. From an energy use standpoint, it can be argued that it is "double counting" to include the gas consumed to produce electricity. The air quality implications are, however, considered in Section IV of this report.

When natural gas used in power generation is included, the SCAG region forecast looks quite different (see Figure 19). According to the Gas Report, a steep short-term drop in natural gas demand for electricity production is foreseen for Southern California as more power is produced outside this region – for example, in northern Mexico. Another factor contributing to this forecasted drop is the retrofitting of existing plants with more efficient combustion technology, accompanied by the eventual retirement of plants that cannot produce power at competitive costs.

Figure 19



Source: 2000 California Gas Report (2000 data from California Gas Report 2001 Supplement)

Natural gas companies plan to supply Southern California's future natural gas needs by creating a new gas terminal and pipeline infrastructure in northern Baja California. In the wake of the North American Free Trade Agreement (NAFTA), several new projects have been built or are proposed that will supply northern Mexico as well as Southern California. One of the most

notable, the North Baja Gas Pipeline, is under construction as of mid-2002 and will run 215 miles through both the U.S. and Mexico. In addition, the capacity of domestic pipelines is being increased, and some pipelines are being converted from petroleum to natural gas service.

Petroleum

SCAG's 2001 Regional Transportation Plan projects vehicle miles traveled (VMT) and associated petroleum fuel usage for 2025. Despite the spread of alternative fuels, petroleum usage in the SCAG region, including gasoline and diesel fuel for light-, medium-, and heavy-duty vehicles, is expected to continue to grow over the next twenty years (see Table 5).

Table 5 SCAG Region Fuel Consumption Projections, 2020 and 2025

	2020	2025
Vehicle Fuel Consumption (gal/day)		
CA*	63,882,192	not available
SCAG**	22,571,814	23,653,149
SCAG Percentage	35.3%	--
Vehicle Miles Traveled (miles/day)		
CA*	1,218,594,521	not available
SCAG**	469,349,492	490,076,069
SCAG Percentage	38.5%	--

** California Department of Transportation, CA Motor Vehicle Stock, Travel and Fuel Forecast, 1998 report.*
*** SCAG 2001 Regional Transportation Plan.*

Under legislation passed in 2000 (AB 2076), the California Energy Commission and the California Air Resources Board are conducting a joint process to develop strategies to reduce California's dependence on petroleum. The base case forecast developed in the AB 2076 process sees statewide transportation energy demand growing by roughly 2% per year: gasoline by about 1.6% per year, diesel by about 2.4% per year, and jet fuel about 3.4% per year.[34] The base case forecast assumes that by 2020, hybrid gasoline-electric vehicles will make up 6 percent of cars sold in the state, and the forecast includes projections for natural gas and electricity use in transportation. These forecasts have not been adjusted to account for any long-term impacts of the September 11, 2001 attacks.

As in past years, the base case forecasts indicate that VMT will continue to grow faster than population, given the growing accessibility of cars and the continued low price of transportation fuels. The state is currently at 95% of its petroleum refining capacity, but the CEC still projects an essentially stable price for gasoline for the foreseeable future (about the next 20 years). The mandated phase-out of air pollution control additive MTBE[35] has price and supply implications; ethanol, still the most likely replacement, has a lower energy content.

The CEC also presents a more optimistic alternative forecast in which fuel efficiency gains are greater and more hybrid and alternative fuel vehicles enter the fleet. This assumption reduces projected 2020 gasoline demand by about 5 percent. It is important to note that, given the severe air quality restrictions in the SCAG region, the VMT and fuel consumption projections in the 2001

RTP are even more conservative – i.e., a greater level of adoption of alternative fuel vehicles is assumed – than the optimistic alternative forecast of the CEC for the state as a whole.

The AB 2076 process has also generated two other products:

- An analysis of several different strategies to reduce petroleum dependence, categorized as fuel efficiency strategies, fuel displacement strategies, pricing strategies, and others such as land use planning. The draft report[36] presents the relative costs of various fuel displacement options, assuming (among other things) that all the technologies studied are fully commercialized. Cost estimates generally include the cost of government revenue losses from transportation fuel taxes.
- An analysis of the environmental and economic benefits of reducing petroleum dependence, including analysis of the relative costs and benefits of the various strategies identified in the foregoing report.[37]

One aim of the AB 2076 process is to set goals for reducing the rate of growth in demand for petroleum fuels. As such, this may be the first policy that begins to move California towards alternative fuels and away from traditional gasoline- and diesel-fueled transportation. Under another law, SB 1170, the state government is implementing its own clean-fuel vehicle fleet and CEC is developing recommendations for a fuel-efficient tire program.

Despite the absence of an overarching national or state policy to foster alternatives to petroleum, the CEC, U.S. Department of Energy, local air districts, non-governmental organizations, and others have launched many transportation energy-related initiatives. CEC heavy-duty vehicle programs include the Carl Moyer incentives to adopt low-emission technologies like natural-gas engines, the low-emission school bus program, natural gas liquefaction technology demonstration sites, and CEC support for the public-private California Fuel Cell Partnership. Light-duty vehicle programs include incentives for electric and highly efficient vehicles, alternative-fuel infrastructure funding, a Clean Fuels Market Assessment Study, and total fuel cycle efficiency studies for light- and heavy-duty vehicles. CEC also administers the federal Clean Cities program, an incentive program to move city fleets towards alternative fuel vehicles.

Within the SCAG region, the SCAQMD has also taken steps to encourage the deployment of alternative-fuel vehicles and infrastructure, even though its authority over vehicles is not as broad as the state's. The agency has recently adopted a suite of fleet rules designed to move public fleets towards alternative fuels. The rules require that, for fleets of 15 or more vehicles, new or replacement vehicles be either low-emission or alternative-fueled. The rules apply to vehicle types including transit buses, trash trucks, school buses, and other public fleet vehicles, and also extend to commercial fleets providing ground access to airports.

Additional SCAQMD rules encourage large employers and public entities to submit bids under the Air Quality Investment Program, which funds projects to reduce motor vehicle emissions through engine retrofits, mass transit deployments, and old-car scrapping, among other strategies.

IV. Energy Use Implications

This section examines some of the implications of energy use, primarily from an environmental and infrastructure standpoint. Generally, only air quality impacts are quantified in this chapter, although impacts on water and biological resources are discussed qualitatively where possible. Environmental impacts, in turn, may have considerable human health impacts: for example, a recent study by Brigham Young University and New York University found that exposure to fine particulate matter – emitted from power plants and mobile sources – in urban air produced a lung cancer risk similar to that posed by living with a smoker.[38]

Energy use has other broad implications that go beyond the scope of this chapter. Energy use is related – as both cause and result – to population and employment growth, land use, and economic development. Energy infrastructure decisions are decisions to commit land and often biological resources. These decisions involve tradeoffs that should be considered within the framework of environmental justice policy. Siting of generating facilities just outside U.S. borders is beginning to raise questions of transboundary impacts. Environmental impacts go beyond air and water quality to include solid and hazardous waste and the potentially global impacts of greenhouse gas emissions. And all energy use has economic costs, many of which have traditionally been external to economic transactions.

While valuable research has been done on the issue of energy use implications, much more extensive study is needed to allow truly informed energy planning and decision making. Only with good information on the implications of energy use can we choose energy sources that strike the best balance between costs and benefits.

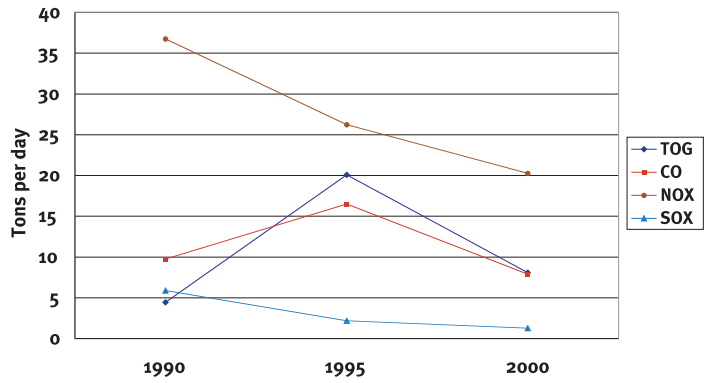
Electricity

Given the restructuring of the California electricity market and the changes in the planning process, it has become much harder to predict the growth in electric generating capacity. Under AB 1890, investor-owned utilities no longer own gas-fired generating plants and cannot build new ones. Decisions to build generating capacity are made in the private sector according to internal assessments of likely profits and return on investment.

For the entire state (not for the SCAG region), the California Energy Commission has modeled several different scenarios to simulate the wholesale spot price of power, as a means of predicting what generating infrastructure might be built. In general, the CEC's analysis indicates that enough new capacity will come on line in the Western United States between 2002 and 2005 to depress spot prices and deter much further construction beyond 2005.[39] Given the uncertainty in future supply, California's, and the SCAG region's, actual electricity outlook depends in part on how well we maintain conservation efforts. Also, new power supplies may in some cases reach the region through new transmission lines, whose construction is not without controversy.

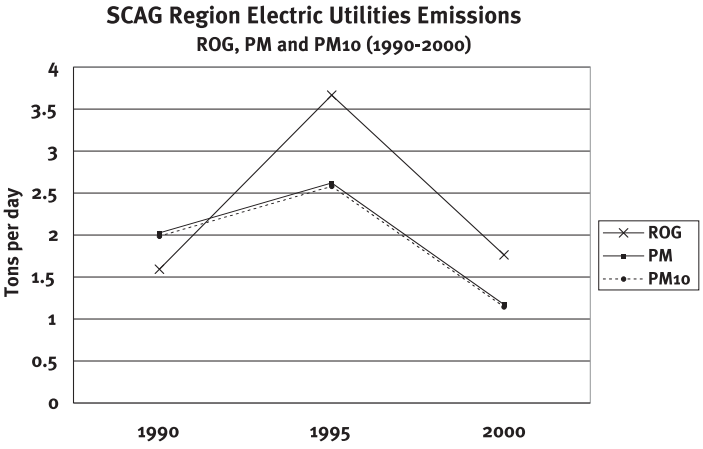
CARB maintains a database of emissions data by county that includes emissions from electric utilities. From 1990 to 2000, emissions of most criteria pollutants from utility operations have decreased substantially: particulate matter by over 40%, NOx by 45%, and SOx by nearly 80%. Carbon monoxide (CO) emissions have dropped by about 20%, but total organic gases (TOG) have grown by over 80% and reactive organic gases (ROG) by 11%, according to the CARB data (see Figure 20 and Figure 21).

Figure 20



Source: ARB, Custom CEFS Report, 2002.

Figure 21



Source: ARB, Custom CEFS Report, 2002.

According to the CEC's Environmental Performance Report of California's Electric Generating Facilities, power plants statewide have gone from producing 8% of the state's total NOx emissions in 1975, to 2.2% in 2000, and from 2.7% of the state's PM10 in 1975 to less than half a percent in 2000. These emission reductions have resulted from increased efficiency of power plants, increased use of combined-cycle and cogeneration technologies, installation of required pollution controls, and shifts to cleaner-burning fuels such as natural gas. Increases in organic gas emissions may be a result of some NOx pollution control technologies.[40]

Future projections of power plant emissions are not as optimistic, however, since many of the lowest-cost improvements have already been made. Increasing demand for energy, at least in a business-as-usual scenario, means that emissions of most power plant pollutants are likely to begin increasing again, with the possible exception of NOx, for which emission controls are still being installed under state law that takes effect in 2005 (see Figure 22 and Figure 23).

Figure 22

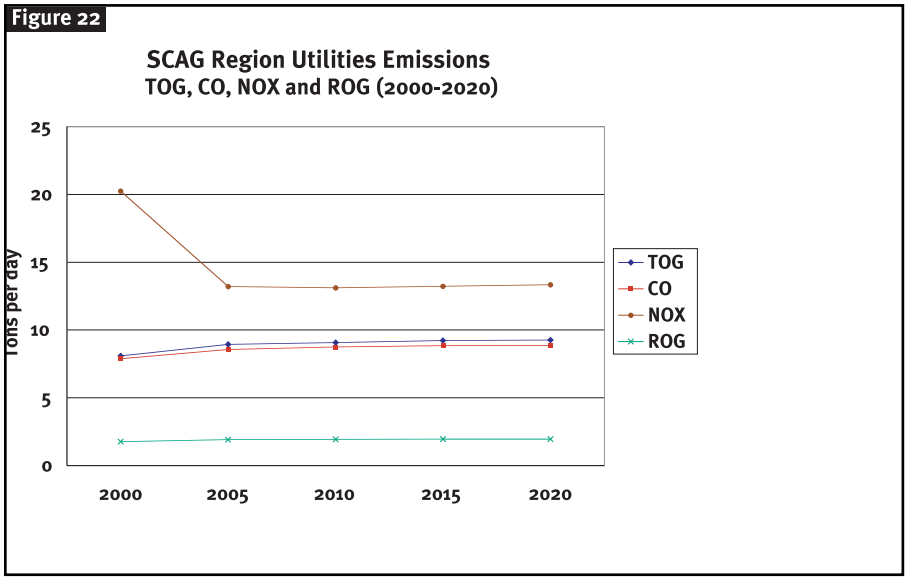
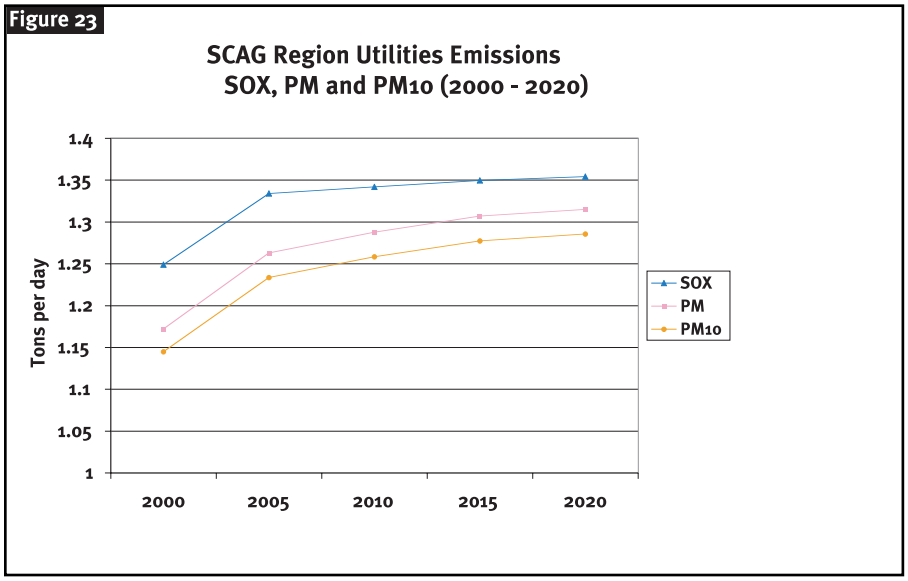


Figure 23



Power plants' environmental impacts are not limited to air emissions, but there is no specific data available for the SCAG region on other types of impacts. Power plants may use ground water or surface water, including rivers, bays and oceans, as a source of cooling and as a location for wastewater discharge that may carry pollutants or heat. Newer plants are less likely to use water for once-through cooling, and there is a trend toward dry cooling that may further reduce the water resource impacts of power generation.[41] Power facility construction has also negatively impacted biological resources, including both wildlife and habitat, although the trend is toward smaller-footprint facilities that are less disruptive.[42]

Transportation-Related Impacts

SCAG's 2001 Regional Transportation Plan projects the infrastructure that will be needed to support the projected regional travel demand in 2025. Total highway lane miles are projected to grow by 13% between 1997 and 2025, while transit route miles are projected to increase by 22% (see Table 6).

Table 6 Transportation Infrastructure in the SCAG Region

	1997	2025
Highways		
Lane Miles	8,906	10,076
HOV Miles	582	1,354
Transit		
Vehicles	3,187	4,559
Route Miles	14,170	17,276

Source: 1997 and 2025 Highway numbers from 2001 RTP, C-3 and C-8
1997 and 2025 Transit numbers from National
Transit Database and RTP

According to CARB emissions data for SCAG counties, emissions of criteria pollutants from transportation[43] have decreased over the last decade (see Figure 24 and Figure 25). Emissions of CO (not shown) have exhibited a similar trend. These decreases have occurred, of course, despite dramatic increases in travel (see Table 3 and Table 5), thanks to cleaner-burning fuels, pollution controls, and some increase in efficiency of vehicle engines.

Figure 24

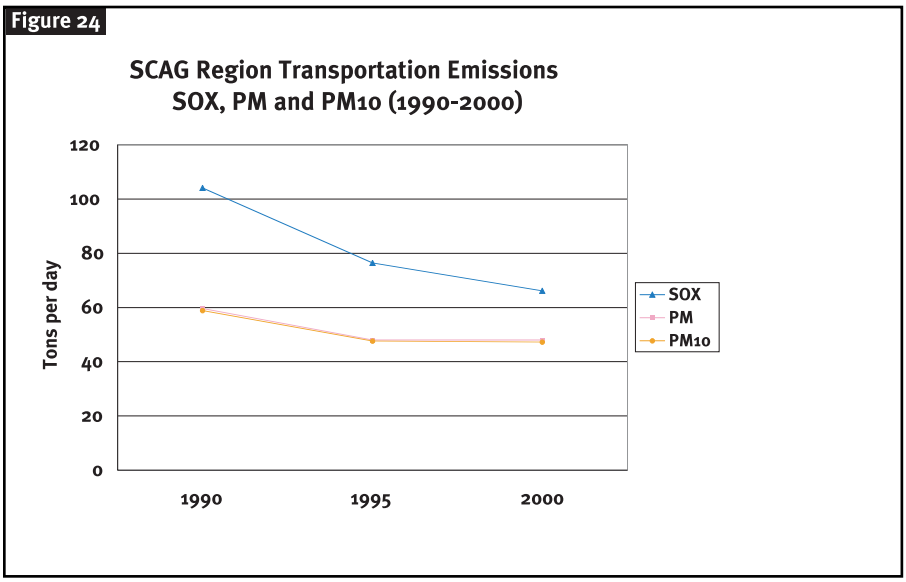
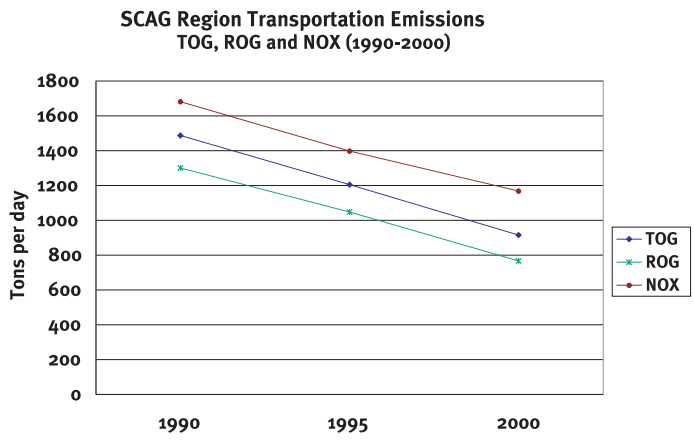


Figure 25



Source: ARB, Custom CEFS Report, 2002.

For most criteria pollutants, CARB projects that transportation emissions will continue to drop between now and 2020 (see Figure 26 and Figure 27). Again, CO emissions are not shown but follow a similar trend to that for TOG, ROG and NOx. The exception to this trend is SOx, emissions of which are projected to decrease for on-road mobile sources as sulfur is removed from gasoline and diesel fuel, but will increase overall due to growing use of other mobile sources. This category includes aircraft, commercial and private boats, trains, off-road vehicles and farm equipment.

Figure 26

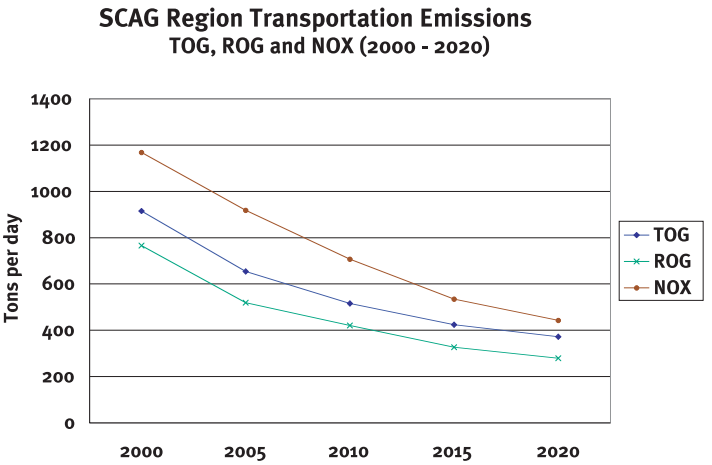
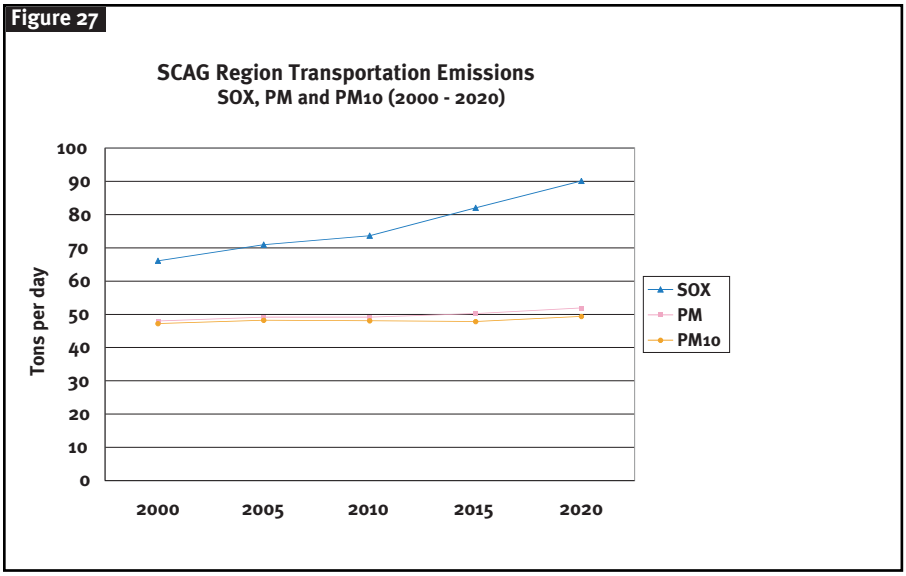


Figure 27



As with power generation, the environmental implications of transportation energy use go well beyond criteria pollutant emissions. As part of the AB 2076 process, consultants to the CEC and CARB have produced a draft analysis of the environmental and economic benefits and costs of various ways of reducing petroleum use in the state.[44] The consultant's preliminary report examines toxic air contaminants and greenhouse gas emissions in addition to criteria pollutants, although the analysis quantifies only "marginal" emissions – those arising from new facilities, systems, or infrastructure needed to accommodate the various scenarios. Once the data are final, the methodologies could likely be adapted to provide emissions estimates and trends for toxics and greenhouse gases for the SCAG region.

The CEC-CARB consultant report also discusses the "multi-media" impacts of petroleum use: particularly water and soil impacts from accidental and intentional pollutant discharges related to the production, transportation, and storage of fuels. For example, the report estimates that marine terminal petroleum spills in California (not just the SCAG region) average 3,357 gallons annually and cost an average of $16,698 to clean up, while open ocean petroleum spills average 60,157 gallons annually, and cost an average of over $210 million to clean up. Transportation spills average over 2 million gallons annually and cost over $63 million per year to clean up.[45] The consultant's analysis shows that for all petroleum reduction scenarios where multi-media impacts were analyzed, there were positive economic benefits from reducing spills.[46]

Other Energy-Related Emissions

Emissions result from other energy uses in the SCAG region. CARB has estimated emissions from energy use in manufacturing and industry, food and agricultural processing, service and commercial operations, residential fuel combustion, and cooking. Total criteria pollutant emissions from these energy uses have been fairly flat over the last decade (see Figure 28 and Figure 29), but are projected to increase slightly over the next 20 years (see Figure 30 and Figure 31). Various "waste-to-energy" techniques and other technologies that minimize, re-use, or divert waste can mitigate environmental impacts, including air emissions, from all of these industrial sectors.

Figure 28

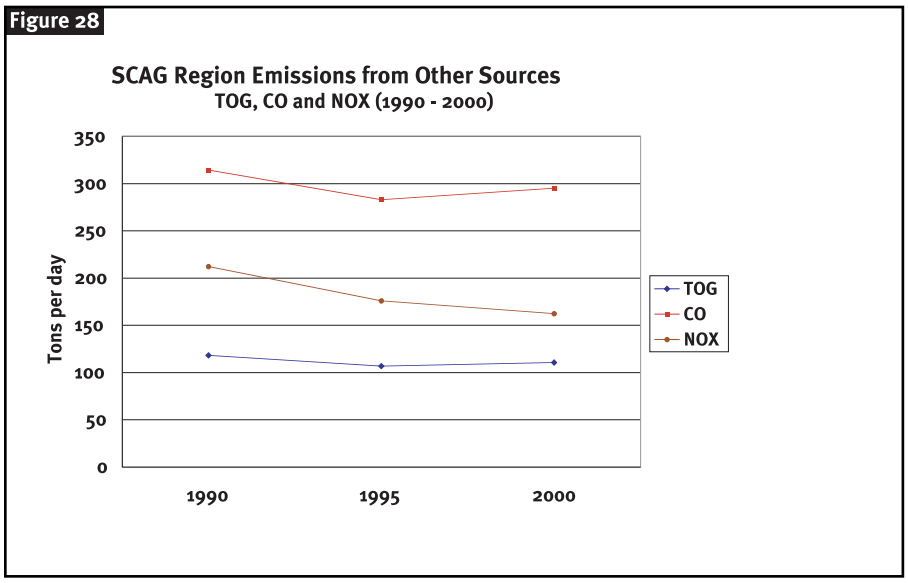


Figure 29

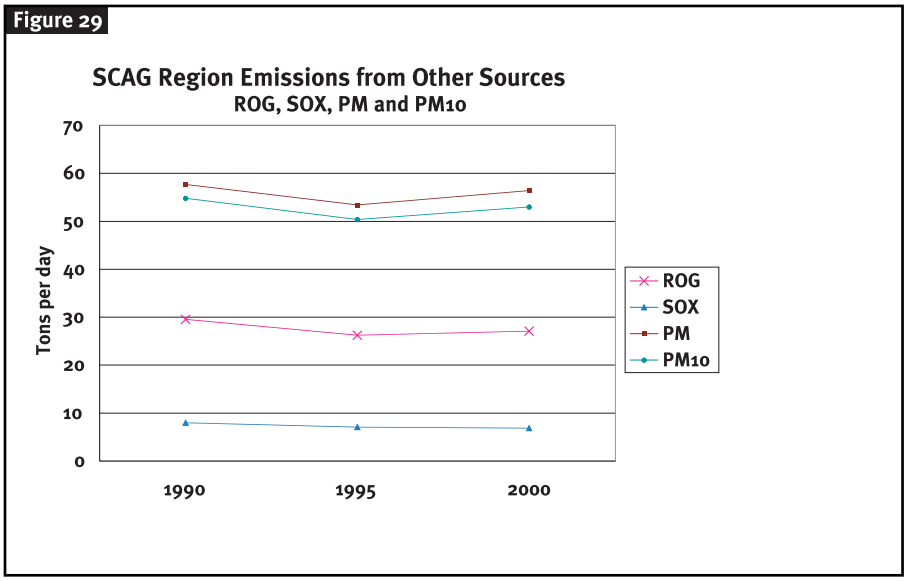


Figure 30

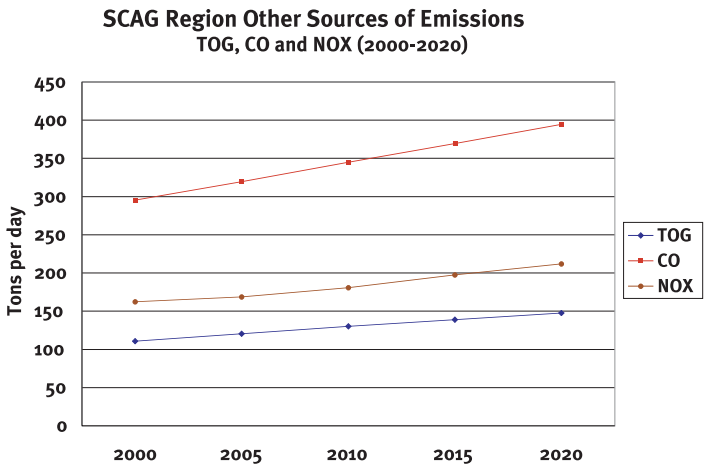
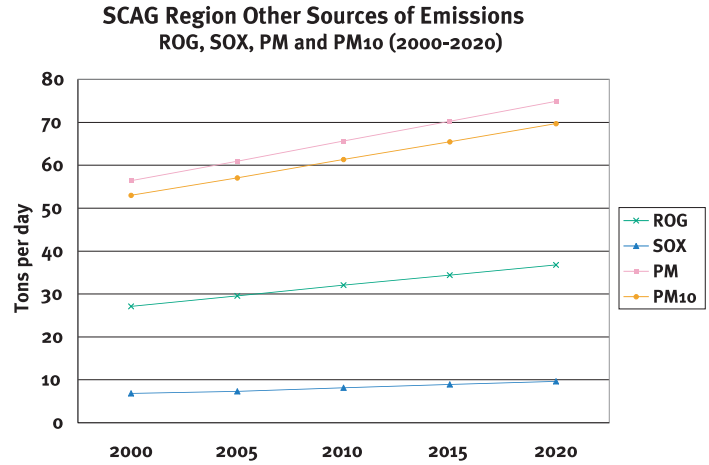


Figure 31



V. Energy Efficiency and Demand Side Management

The recent crisis in California's energy supply has redirected attention from "energy efficiency" to a variety of measures that can reduce energy consumption in the short-term, reduce consumption in the long-term, and reduce peak demand. Measures that can achieve one or more of these goals include appliance and building efficiency standards; distributed generation that can offset peak demand; retrofits like light-colored roofs to reduce peak cooling needs; and changes in consumer behavior such as replacing incandescent with fluorescent light bulbs or raising the thermostat in summer.

Overall, these measures are often referred to as "demand side management," which encompasses three broad categories: demand management, energy efficiency, and distributed generation. Demand management generally indicates programs designed to shift load away from times of peak demand, or to otherwise even out power demand. This can be achieved through technology or via human actions, and is sometimes linked with the cost of electricity. The 20/20 program, in which voluntary reductions of 20% in residential power use earned a 20% discount on the power bill, is an example of demand management. Distributed generation (discussed in Section II of this report) refers to small generating equipment on either the utility or the customer side of the meter that can displace the need for central grid power.

Energy efficiency refers to the purchase and use of equipment, like lighting or appliances, that is designed to be more energy-efficient, or the implementation of building design standards. Since the early 1990s, energy efficiency funds have been collected via ratepayer surcharges, referred to as public goods charges, and administered by the state's IOUs under a process overseen by the CPUC. These funds are offered to residential and non-residential customers to assist them in saving electricity and natural gas, and are also partly devoted to new construction programs aimed at making new buildings and homes more energy-efficient. Statewide, this funding amounts to approximately $300 million per year.

In a restructured electricity market, where the IOUs' profits are no longer set by the CPUC, there is some concern that the utilities will lack an incentive to provide energy efficiency programs. In November 2001, the CPUC decided to set aside 20% of the program funds over the next two years – approximately $100 million – for administration by non-utility parties. The funds would still be collected by the IOUs, but administered by third parties – including cities, counties, and Councils of Government, both regional and subregional – under contract with the IOUs. These set-aside funds are distributed based on a bid evaluation process by the CPUC. If these non-utility programs prove successful, a higher proportion of funding may be made available in the future. A stated goal of the CPUC is to encourage programs designed to reach traditionally underserved energy efficiency targets, such as renters and landlords or low-income households.[47]

City and County Efforts

In the SCAG region, a number of cities and counties have responded creatively to the energy situation, and several had energy efficiency initiatives underway well before the 2000-01 crisis. For several years the cities of Santa Monica and Irvine have been part of the non-profit Regional Energy Efficiency Initiative (REEI), which receives funding from Southern California Edison out of public goods charges. The idea of the REEI, formally created in 1999, was to build energy efficiency partnerships between cities and their serving utilities.[48]

Through this partnership, Santa Monica works with local non-profit housing corporations to design affordable housing to meet energy efficiency goals; with local small business owners to retrofit and fine-tune their equipment and buildings; and with the local school district to educate students about energy conservation. Separately, the city has adopted a Sustainable City policy that includes energy reduction goals.[49] The city also has adopted aggressive "green building" standards that incorporate and promote energy efficiency.[50]

Also through the REEI, the City of Irvine has established energy districts designed to achieve energy efficiency by coordinating the efforts of residents, schools, and local businesses. The city has also worked with residents of senior citizens' communities to replace lighting and appliances with energy-efficient versions and to change behavior to reduce power demand during Stage 3 alerts.

In 2000, Ventura County convened the POWER Task Force (Preserve Our Widely used Energy Resources), which brought together industry leaders and elected officials to identify strategies to avoid the loss of businesses and jobs due to uncertainty about energy price and supply.[51] The group has explored the option of creating a Community Energy Authority (see next section on Demand Side Management Resources) and is working with a local non-profit research partnership to identify technologies that balance energy demand and environmental concerns.

The Inland Empire Utilities Agency, a regional sewage treatment and water agency in the Chino basin, is undertaking a series of integrated organics management projects that will achieve several regional goals, including generating power for use in the basin and possible sale to others. In general, the projects are designed to treat waste from the numerous dairies in the basin, using composting, anaerobic digestion and other technologies to produce fuel known as "biogas" for bioenergy generation. This fuel will be used to power micro-turbines to produce as much as 50 MW of electricity.[52] The project will produce "cow power" while minimizing impacts on air quality, surface water, and groundwater.

The City of Lancaster, located in an area where temperatures can reach extremes, was recognized by the League of California Cities for its energy management system.[53] The system

focuses on lighting, heating, and air conditioning in city facilities and has saved the city 25% on energy bills every year since it was put in place.

According to the Governor's Office of Planning & Research, six local jurisdictions in the SCAG region have adopted optional energy elements in their general plans: Calabasas (1995), Pasadena (1983), Rancho Mirage (1997), City of San Bernardino (1989), Ventura County (1988), and West Hollywood (1989). Many of the energy elements are combined with water conservation elements, and many establish goals and policies that encourage energy-efficient land use and building design, call for energy audits, and provide for public awareness of conservation needs. The Calabasas plan estimates electricity and natural gas consumption rates at build out.

In the transportation energy arena, Sunline Transit, located in Thousand Palms, has converted its entire transit fleet to natural gas, and additionally operates a hydrogen fuel-cell bus and electric vehicles. Its Clean Fuels Mall has attracted worldwide interest in the agency's forward-looking application of environmentally preferable fuels.[54]

A number of California jurisdictions outside the SCAG region, many in the Bay Area, have taken on energy issues in creative and innovative ways. In Fall 2001, voters in the City of San Francisco approved funding for up to 50 MW of new solar installations and 30 MW of wind installations on public facilities, and added renewable energy and conservation projects to the list of project types for which the Board of Supervisors can issue revenue bonds without a public vote.[55]

In Marin County, at least one city has voted to support formation of the Marin Local Energy Council, whose goals include increasing energy supply security and price stability and reducing greenhouse gas emissions by aggregating demand for the whole county.[56] The San Diego Association of Governments (SANDAG) adopted a Regional Energy Plan in 1994 and created the San Diego Regional Energy Office, which is now undertaking an extensive energy infrastructure study to guide energy decision making.[57]

Demand Side Management Resources

Cities and counties can take a variety of actions to address energy use and conservation. Local governments can

- retrofit their own buildings, or design new government facilities, to reduce energy consumption (via lighting, heating, roofing, or other modifications);

- promote similar activities by others, i.e., residents, businesses, and other community members, possibly by adopting standards or ordinances; and
- provide funding for these activities, e.g., through state programs.

The state has responded to the energy challenges with the "Flex Your Power" campaign, which includes a website[58] and advertising. In addition, the state has enacted a broad array of grant and loan programs and other financial incentives for energy efficiency, self-generation, and renewables. Some of the state actions augmented existing programs, while others established new programs, funded from sources including the general fund, ratepayer surcharges, and bonds. See Table 7 for a summary of the $2.8 billion in state funding available for energy efficiency, renewables, and self-generation programs in 2000-2001. Appendix C presents a comprehensive list of state programs. Another useful resource compiled by the Center for Energy Efficiency and Renewable Technologies is titled "Power to Your Pocket: California Consumers Guide to Energy Incentives."[59]

Since 1984, state law has provided that cities, counties, or groups thereof may form Community Energy Authorities. These authorities would have the power to issue tax-exempt debt to finance energy projects, among other things. The Local Government Commission has been working with local jurisdictions and COGs to further develop and implement this concept. Local jurisdictions can also address their energy needs through related steps such as establishing municipal utilities or aggregating demand. The latter has been done for electricity and natural gas purchases by the Association of Bay Area Governments (ABAG) through a "power pool."[60]

Local economic benefits can be realized from instituting energy conservation efforts or promoting the use of distributed generation. The Rocky Mountain Institute, a Colorado think tank, estimates that 70 to 80 cents of every dollar spent on energy by a typical town leaves the local economy.[61] Reducing a community's energy use can thus be an easy way to keep money within the community, purchasing more goods and services from local suppliers. Some kinds of energy efficiency initiatives – lighting retrofits, home energy audits, insulation upgrades, and roof retrofits, to name a few – can even stimulate the creation of new businesses and jobs. In its Community Energy Workbook, the Institute outlines a process that includes energy town meetings and the formation of energy task forces to identify and undertake energy-saving changes tailored to local needs.[62]

Even with the changes in the state's energy situation, the evaluation of efficiency options done in the prior energy chapter is still largely valid and useful as a resource for cities and counties. The relevant chapter sections (summary versions) are included in Appendix D.

Table 7 Summary of State Energy Efficiency & Renewables Programs, 2000-01

Flex Your Power				
PUBLIC FUNDS AUTHORIZED (2000/2001)				
FOR FINANCING				
ENERGY EFFICIENCY AND RENEWABLES PROJECTS AND PROGRAMS				
	FUNDING AMOUNTS (millions) AND PURPOSE			
	ENERGY EFFICIENCY	RENEWABLES	ENERGY EFFICIENCY AND/OR RENEWABLES	TOTALS
SOURCE OF FUNDS	**$777**	**$584**	**$1,461**	**$2,821**
RATEPAYERS	**$399**	**$135**	**$63**	**$597**
Ca Public Utilities Commission (CPUC, Self Gen)	$0	$135	$0	$135
Ca Public Utilities Commission (CPUC, EE Pub Purpose Prgrms)	$299	$0	$0	$299
Ca Public Utilities Commission (CPUC, Low Income EE)	$100	$0	$0	$100
Ca Energy Commission (CEC, Renewables)	$0	$135	$0	$135
Ca Energy Commission (CEC, Public Interest Energy Research)	$0	$0	$63	$63
GENERAL FUND (1)	**$337**	**$65**	**$102**	**$572**
CEC (AB970 & SBx5 & ABx29 Augmentations)	$56	$0	$28	$84
CPUC (EE Pub Purpose Prgm augmentation: Utility-administered)	$58	$0	$0	$58
CPUC (EE Pub Purpose Prgm augmentation: Comm administered)	$39	$0	$0	$39
CPUC (Low Income EE augmentation)	$45	$0	$0	$45
Ca Municipal Utilities (Public Purpose Program Augmentations)	$40	$0	$0	$40
Dept of General Services (DGS)	$0	$0	$40	$40
Housing and Community Dev (HCD) (Low Income EE)	$120	$0	$0	$120
Community Colleges (SB 735)	$0	$0	$34	$34
Calif Conservation Corp (CCC)	$20	$0	$0	$20
Ca Alt Energy & Transp Fin. Authority (CAEATFA) *	$0	$25	$0	$25
Ca Tech, Trade & Comm Agency (TTCA) (Renewable Loan Prgram)	$0	$40	$0	$40
S Coast AQ Management District (SCAQMD; Carl Moyer Prgrm)	$0	$27	$0	$27
BONDS	**$0**	**$350**	**$1,285**	**$1,635**
DGS	$0	$0	$250	$250
Ca Alt Energy & Transp Fin. Authority (CAEATFA)*	$0	$350	$0	$350
Ca Industrial Development Financing Advisory Commission*	$0	$0	$35	$35
Ca Consumer Power and Cons. Fin Authority (CCPCFA)**	$0	$0	$1,000	$1,000
SPECIAL FUNDS	**$0**	**$7**	**$11**	**$18**
S Coast AQ Management District (SCAQMD)	$0	$7	$1	$8
Ca Integrated Waste Management Board (IWMB)	$0	$0	$10	$10

*CAEATFA and CIDFAC are administered by the State Treasurer's Office.

** The CCPCFA, established by SBx6, became operational on August 24th, 2001; the actual purpose, timing, allocation, and selection (approval/ownership/payment process and verification) for use of these funds (central grid versus onsite generation) has not been determined.

(1)GENERAL FUND MONIES (AB970, SBx5 and ABx29) NOT INCLUDED ABOVE:		NOTES
Total General Fund Appropriations (not included)	$230	Costs unlikely to have verifiable, sustainable effects
CEC Load Management Programs	$190	Costs unlikely to have verifiable, sustainable effects
CPUC Administered Load Management (AB970 Load Control)	$13	Costs produce only peak demand savings, with no sustainable reduction in energy use
CPUC/Utility Administered Load Management (R.00.10.002)	$0	Costs and benefits dependent on frequency and duration of Rolling Blackouts
DCA (media costs for energy efficiency and load management)	$20	DCA=Department of Consumer Affairs

Source: http://www.governor.ca.gov/state/govsite/gov_homepage.js, Flex Your Power. On line, follow links from this table to get more information on specific programs.

VI. Where Do We Go From Here?

As the foregoing sections show, changes in the California energy markets have made energy planning more difficult. While there is more data available on the impacts of energy choices, the lack of integrated planning among responsible entities – regulatory agencies, utilities, private industry, and local governments – makes it hard to say whether the SCAG region has a secure energy future. The wide variety of state demand side management programs being offered surely indicates the state's commitment to energy conservation, but it has been criticized as uncoordinated, inefficient, and confusing to consumers.[63]

In California, much local and even state-level energy policy has evolved in the absence of any state or national energy goals. Individual actors – lawmakers, agency leaders, non-governmental organizations, cities – have instituted efficiency programs, incentives for alternative-fuel vehicles, or rebates for distributed generation facilities because they were motivated by a belief that these programs would provide social benefits greater than their costs. However, without a clear statement of energy goals – for example, a certain percentage of power from renewable sources by a certain date – Californians will simply be lucky if all these efforts lead to a desirable outcome.

In June 2002 the CPA, CPUC, and CEC boards met jointly and expressed their desire to engage in integrated resource planning and to develop a "policy for California that assures energy-supply reliability, quality energy, an adequate reserve...understanding that if we are not absolutely committed to protecting the environment, that in the long run we will not survive and not succeed; and that we also are going to be practical about making sure we keep the lights on and that we can have a very prosperous economy."[64]

To support this outcome, SCAG should take steps to build the information needed to make appropriate energy decisions for the region. Recommended initial steps include, in rough order of priority:

- Given the clear need for energy planning and coordination of energy efficiency efforts in the region, continue to investigate the potential role of SCAG in coordinating such planning in conjunction with the closely related efforts of transportation planning, air quality planning, watershed planning, and growth visioning.
- Continue to develop data on the implications of energy usage, especially on emissions of toxic air contaminants and greenhouse gases and possibly for other media besides air.
- Support state and local efforts to better coordinate demand side management programs and the development of overall energy policies and goals.
- In conjunction with the SCAG Growth Visioning and State of the Region processes, develop regional energy performance indicators and goals for those indicators.

- In conjunction with the SCAG Growth Visioning process, conduct scenario analysis to compare the energy demand impacts of the regional growth patterns evaluated, such as compact vs. dispersed growth.
- Further investigate the potential benefits to the region from encouraging distributed energy resources and combined heat, cooling and power, possibly by holding a conference for cities on these technologies.
- Conduct energy demand modeling for the SCAG region, based on regional population, housing and employment forecasts.

Endnotes

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2 San Diego Gas & Electric serves a small number of customers in South Orange County.

3 Congressional Budget Office, "Causes and Lessons of the California Electricity Crisis," September 2001.

4 Timothy J. Brennan, "The California Electricity Experience, 2000-01: Education or Diversion?," Resources for the Future, http://www.rff.org/reports/PDF_files/3607BrennanCA.pdf.

5 California Energy Commission, 2002 – 2012 Electricity Outlook Report, Commission Final, February 2002, P700-01-004F.

6 At Stage 1, customers who have agreed to interruptible service should prepare for potential outages. At Stage 2, interruptible loads will be interrupted. At Stage 3, firm loads may also be interrupted.

7 California Independent System Operator, System Status Log, 1998-2001, http://www.caiso.com/docs/09003a6080/08/8a/09003a6080088aa7.pdf.

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18 California Energy Commission, Distributed Generation Strategic Plan, June 2002, P700-02-002, p. 2.

19 According to the California Alliance for Distributed Energy Resources (CADER), "DG is generation, generation-like and storage devices that are connected to the distribution level of the [transmission and distribution] grid on either the system side or the customer side of the meter. DSM that alleviates congestion is included in the discussion about DG measures on the customer side of the meter." (Letter from CADER to Richard Bilas, President, California Public Utilities Commission, dated June 5, 1998.)

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21 U.S. Department of Energy, Strategic Plan for Distributed Energy Resources, September 2000, p. 20. See http://www.eren.doe.gov/der/pdfs/derplanfinal.pdf.

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23 2000 Integrated Resource Plan, City of Los Angeles Department of Water and Power, August 15, 2000, p. 7 (Table 3).

24 Making Connections: Case Studies of Interconnection Barriers and their Impact on Distributed Power Projects, National Renewable Energy Laboratory NREL/SR-200-28053, July 2000, pp. ii-iii.

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33 The current CEC forecast was adopted in 2000 and does not reflect conservation measures taken in 2001. The next natural gas forecast, due in October 2002, may be lower.

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35 Methyl tertiary-butyl ether.

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37 See Benefits of Reducing Demand for Gasoline and Diesel, Volume 3, Task 1. Joint Report to California Air Resources Board and California Energy Commission. Prepared by Arthur D. Little, Inc., April 12, 2002.

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42 Ibid., p. 41.

43 Including emissions from on-road motor vehicles, other mobile sources, and petroleum marketing.

44 Benefits of Reducing Demand for Gasoline and Diesel, Volume 3, Task 1. Joint Report to California Air Resources Board and California Energy Commission. Prepared by Arthur D. Little, Inc., April 12, 2002.

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57 See http://www.sdenergy.org/planning/energy_plan.html.

58 See http://www.flexyourpower.ca.gov/state/fyp/fyp_homepage.jsp.

59 Available from CEERT, 1100 Eleventh Street, Suite 311, Sacramento, CA 95814, or at http://www.ceert.org/pubs/crrp/index.html.

60 The electricity purchasing function was suspended in early 2001.

61 Rocky Mountain Institute, Community Energy Efficiency website, http://www.rmi.org/sitepages/pid302.php.

62 See Rocky Mountain Institute, Community Energy Workbook: Overview of the Process, http://www.rmi.org/sitepages/pid308.php.

63 Comments of the Office of Ratepayer Advocates (ORA) on Demand Management, Energy Efficiency, and Distributed Generation Programs, filed at Joint CPUC, CPA, CEC Meeting, June 7, 2002. http://www.ora.ca.gov/Administration/June702_comments_Power_AuthMeeting.doc.

64 Transcript of Joint Meeting of the State of California, California Energy Commission, California Public Utilities Commission, California Consumer Power and Conservation Financing Authority, June 7, 2002, 9:30 a.m. to 12:30 p.m., San Francisco, CA, pp. 124-125, statement of CPA Director Sunne Wright McPeak.

Appendix A

SCAG Region Power Plants

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
IMPERIAL RESOURCE RECOVERY	IMPERIAL RESOURCE RECOVERY ASSOCIATIES or SCHOLL CANYON SLF	WTE	BIOMASS	AG. & ANIMAL WASTE		15	NOT COGEN	18.1	1/1/90	SCE	IMPERIAL	3505 HIGHWAY 111	HYDRA-CO ENTERPRISES, INC	WESTERN POWER GROUP, INC
COLMAC	A.K.A MECCA PLANT	WTE	BIOMASS	AG. & WOODWASTE	AGRICULTURAL WASTE	49.9	NOT COGEN	49.9	1/1/68	SCE	RIVERSIDE	62-300 GENE WELMAS DRIVE (HWY 111 AND AVENUE 62)	COLMAC ENERGY INC	COLMAC ENERGY
WESTERN ROCK PRODUCTS		WTE	BIOMASS	BIOMASS	POTENTIAL ENERGY RECOVERY	0.25	NOT COGEN	0.25	4/1/87	SCE	SAN BERNARDINO	31290 TROY ROAD	WESTERN ROCK PRODUCTS	WESTERN ROCK PRODUCTS
ACE COGENERATION COMPANY	ACE (ARGUS COGEN EXPANSION) COGEN	COAL	COAL	COAL	COAL-FIRED TOPPING CYCLE	97		108	5/1/85	SCE	SAN BERNARDINO	12801 MARIPOSA STREET	A/C POWER	A/C POWER /ACE COGEN COMPANY
ARGUS	NORTH AMERICAN CHEMICAL CO.	COAL	COAL	COAL	COAL-FIRED TOPPING CYCLE	62.5	COGEN	62.5	4/1/83	SCE	SAN BERNARDINO	13200 MAIN STREET	NORTH AMERICAN CHEMICAL CO	NORTH AMERICAN CHEMICAL CO
RIVERSIDE CEMENT COMPANY		COAL	COAL	COAL	COAL FIRED BOTTOMING CYCLE	17	COGEN	17	6/8/79	SCE	SAN BERNARDINO	19409 NATIONAL TRAILS HIGHWAY	RIVERSIDE CEMENT COMPANY	RIVERSIDE CEMMENT CO.
DIESELS		OIL/GAS	OIL/GAS	DIESEL		26	NOT COGEN			VERNON	LOS ANGELES	2705 SOTO STREET		
CO. SAN. DIST. #32 OF LA CO. (VALENCIA)		WTE	DIGESTER GAS	DIGESTER GAS	DIGESTER GAS/MUNICIPAL	0.5	NOT COGEN	0.5	9/22/87	SCE	LOS ANGELES	28185 THE OLD ROAD	L.A. COUNTY SANITATION DISTRICT	L.A. COUNTY SANITATION DISTRICT
TOTAL ENERGY FACILITY, CO. SANITA		OIL/GAS	OIL/GAS	DIGESTER GAS	GAS TURBINE COMBINED CYCLE	16.5	COGEN	16.5	6/12/95	SCE	LOS ANGELES	24501 SOUTH FIGUEROA	LA COUNTY SANITATION DISTRICT	COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
PLANT NO. 2, ORANGE COUNTY SANITA		WTE	DIGESTER GAS	DIGESTER GAS	DIGESTER GAS/OTHER	12	NOT COGEN	12	7/27/93	SCE	ORANGE	22212 BROOKHURST AVENUE		ORANGE COUNTY SANITATION DISTRICT
ALISO WATER MANAGEMENT AGENCY		WTE	DIGESTER GAS	DIGESTER GAS	DIGESTER GAS/MUNCIPAL	1.2	NOT COGEN	1.2	6/6/83	SCE	ORANGE	29201 LA PAZ ROAD	ALISO WATER MANAGEMENT AGENCY	ALISO WATER MANAGEMENT AGENCY
ORANGE COUNTY SANITATION DISTRICT PLANT 1	RECLAMATION PLANT #1-FOUNTAIN VALLEY	OIL/GAS	DIGESTER GAS	DIGESTER GAS	GAS-FUELEDRECIPROCATING ENGINE	4.5	COGEN	4.5	6/16/93	SCE	ORANGE	10844 ELLIS AVENUE	O'BRIEN ENERGY SYSTEM INC	ORANGE COUNTY SANITATION DISTRICT
CITY OF PALM SPRINGS		WTE	DIGESTER GAS	DIGESTER GAS	DIGESTER GAS/MUNICIPAL	0.25	NOT COGEN	0.25	5/5/83	SCE	RIVERSIDE	4375 MESQUITE	CITY OF PALM SPRINGS	CITY OF PALM SPRINGS
CHINO BASIN MUNICIPAL WATER DISTRICT		WTE	DIGESTER GAS	DIGESTER GAS	DIGESTER GAS/MUNICAPAL	0.58	NOT COGEN	0.58	12/28/92	SCE	SAN BERNARDINO	8555 ARCHIBALD AVENUE		
BRAWLEY		OIL/GAS	OIL/GAS	DISTILLATE OIL	COMBUSTION TURBINE	20	NOT COGEN	23	6/27/86	IID	IMPERIAL	750 DOGWOOD ROAD	IID	IID
SALTON SEA I, PHASE 2	FISH LAKE POWER CO./EARTH ENERGY INC-SALTON SEA I, PHASE 2	GEOTHERMAL	GEOTHERMAL	GEOTHERMAL	GEOTHERMAL	36	NOT COGEN	36	5/9/96	SCE	IMPERIAL	6922 CRUMMER ROAD	EARTH ENERGY	
DOUBLE WEIR		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.6	NOT COGEN	0.6	8/1/61	IID	IMPERIAL		IID	IID
DROP 1		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	5.2	NOT COGEN	6	10/1/84	IID	IMPERIAL		IID	IID
DROP 2		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	9	NOT COGEN	10	12/1/53	IID	IMPERIAL		IID	IID
DROP 3		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	9	NOT COGEN	9.8	2/1/41	IID	IMPERIAL		IID	IID
DROP 4		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	18.05	NOT COGEN	19.6	2/1/41	IID	IMPERIAL		IID	IID
DROP 5		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	3.3	NOT COGEN	4	3/1/82	IID	IMPERIAL		IID	IID
EAST HIGHLINE		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	1.1	NOT COGEN	2.4	9/1/84	IID	IMPERIAL		IID	IID
PILOT KNOB		HYDROELECTRIC	HYDRO	HYDRO	HRDRO,WATER	7	NOT COGEN	33	1/1/57	IID	IMPERIAL		IID	IID
SENATOR WASH		HYDROELECTRIC	HYDRO	HYDRO		7.2	NOT COGEN		8/1/86	IID	IMPERIAL		USBR	USBR
TURNIP		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	0.4	NOT COGEN	0.4	10/1/64	IID	IMPERIAL		IID	IID
AZUSA		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	2	NOT COGEN	3	2/1/49	PASADENA	LOS ANGELES			CITY OF PASADENA
ALAMO		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	17	NOT COGEN	17	7/31/86	SCE	LOS ANGELES	31849 N. LAKE HUGES ROAD	CDWR	CDWR
EAST PORTAL HYDRO STATION/CALLEGU	A.K.A. EAST PORTAL	HYDROELECTRIC	HYDRO	HYDRO	PRESSURE-REDUCING STATION	1.25	NOT COGEN	1.25	10/1/84	SCE	LOS ANGELES	OFF DEVONSHIRE ST, IN WEST CENTRAL PORTION OF CHATSHWORTH PARK	CALLEGUAS MWD	CALLEGUAS MWD
CITY OF EL SEGUNDO		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.52	NOT COGEN		11/6/89	SCE	LOS ANGELES	2151 EL SEGUNDO	CITY OF EL SEGUNDO	CITY OF EL SEGUNDO
FOOTHILL FEEDER		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	11	NOT COGEN	9	4/1/81	SCE	LOS ANGELES	31849 N. LAKE HUGHES ROAD	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
FOOTHILL		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, GAS TURBINE	10	NOT COGEN	11	10/6/71	LADWP	LOS ANGELES	14351 SAN FERNANDO ROAD	LADWP	LADWP
FRANKLIN		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, GAS TURBINE	2	NOT COGEN	2	6/3/21	LADWP	LOS ANGELES	1298 N BEVERLY DRIVE	LADWP	LADWP
G SQUARED ENERGY (ALAMITOS BARRIER)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.25	NOT COGEN	0.25	12/23/86	SCE	LOS ANGELES	WOODRUFF AND WARDLOW	G SQUARED ENERGY NO. 2	G SQUARED ENGY NO. 2
GREG AVENUE		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	1	NOT COGEN	1	12/1/79	LADWP	LOS ANGELES	7554 GREG AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
DOMINGUEZ GAP BARRIER	HYDRO ELECTRIC CONST (DOMINGUEZ GAP BARRIER)	HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.275	NOT COGEN	0.275	12/30/86	SCE	LOS ANGELES	218 PLACE AND ALAMEDA STREET	CAPITAL ENERGY COMPANY	G SQUARED ENERGY
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT	F.K.A. BASIN BARRIER HYDROELECTRIC	HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.93	NOT COGEN	0.95	12/23/85	SCE	LOS ANGELES	2155 E. EL SEGUNDO	BASIN BARRIER HYDRO ELECTRIC	WEATHERLY PRIVATE CA
RIO HONDO		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	1.8	NOT COGEN	1.9	3/1/84	SCE	LOS ANGELES	9540 MILLER WAY	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
SAN DIMAS		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	10	NOT COGEN	9.9	6/1/81	SCE	LOS ANGELES	1507 SYCAMORE CANYON ROAD	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
SAN FERNANDO	SAN FERNANDO #1-#2	HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, TURBINE - PIPELINE	6.4	NOT COGEN	5.6	10/22/22	LADWP	LOS ANGELES	14031 SAN FERNANDO ROAD	LADWP	LADWP
SAN FRANCISQUITO 2		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, TURBINE - PIPELINE	47	NOT COGEN	42	7/6/20	LADWP	LOS ANGELES	32400 SAN FRANCISQUITO CANYON ROAD	LADWP	LADWP
SAN FRANCISQUITO 1		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, TURBINE - PIPELINE	75.5	NOT COGEN	69.4	4/16/17	LADWP	LOS ANGELES	37000 CLEARCREEK ROAD	LADWP	LADWP
SAN GABRIEL HYDROELECTRIC PROJECT		HYDROELECTRIC	HYDRO	HYDRO	SMALL HYDRO IMPROVEMENT PROJECT	4.975	NOT COGEN	4.975	10/17/87	SCE	LOS ANGELES	9700 NORTH HIGHWAY 39	HYDRO WEST	SAN GABRIEL HYDROELE
SAN DIMAS WASH		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	1.05	NOT COGEN	1.05	1/28/86	SCE	LOS ANGELES	190 EAST FOOTHILL BLVD	SAN GABRIEL VALLEY M	SAN GABRIEL VALLEY M
SANTA MONICA		HYDROELECTRIC	HYDRO	HYDRO		0.15	NOT COGEN		3/1/84	SCE	LOS ANGELES			CITY OF SANTA MONICA
SAWTELLE		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER, TURBINE - PIPELINE	0.6	NOT COGEN	0.6	6/1/86	LADWP	LOS ANGELES	SUNSET BLVD (1 1/2 MILE FROM UCLA)	LADWP	LADWP
SEPULVEDA CANYON		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	9	NOT COGEN	8.5	6/1/82	LADWP	LOS ANGELES	1751 N. SEPULVDEA BLVD	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
THREE VALLEYS MWD (FULTON ROAD STATION)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.2	NOT COGEN	0.2	4/2/87	SCE	LOS ANGELES	2930 FULTON ROAD	THREE VALLEYS MWD	THREE VALLEYS M W D
THREE VALLEYS MWD (MIRAMAR)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.52	NOT COGEN	0.52	4/13/87	SCE	LOS ANGELES	3300 N. PADUA	THREE VALLEYS MWD	THREE VALLEYS M W D
THREE VALLEYS MWD (WILLIAMS AVE STATION)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.35	NOT COGEN	0.35	4/3/87	SCE	LOS ANGELES	3949 WILLIAMS AVE	THREE VALLEYS MWD	THREE VALLEYS M W D
VENICE SMALL CONDUIT		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	10	NOT COGEN	10.1	8/1/82	SCE	LOS ANGELES	3815 SEPULVEDA BLVD	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
VERDUGO		HYDROELECTRIC	HYDRO	HYDRO		0.4	NOT COGEN		12/1/84	SCE	LOS ANGELES			CITY OF GLENDALE
WALNUT VALLEY WATER DISTRICT (#1)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.125	NOT COGEN	0.125	10/17/84	SCE	LOS ANGELES	4102 VALLEY BLVD.,	WALNUT VALLEY WATER DISTRICT	WALNUT VALLEY WATER DISTRICT
WILLIAM E. WARNE	WILLIAM E. WARNE #1-#2	HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	76	NOT COGEN	74.2	11/1/82	SCE	LOS ANGELES	31849 NORTH LAKE HUGHES ROAD	CDWR	CDWR
CITY OF LA HABRA		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.1	NOT COGEN		3/1/82	SCE	ORANGE	LAMBERT STREET AND WALNUT STREET	CITY OF LA HABRA	CITY OF LA HABRA
CITY OF SANTA ANA		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.195	NOT COGEN	0.195	6/30/86	SCE	ORANGE	2415 N. BRISTOL STREET	CITY OF SANTA ANA	CITY OF SANTA ANA
COYOTE CREEK		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	3	NOT COGEN	3.1	4/1/84	SCE	ORANGE	627 S. MONTE VISTA	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
FULLERTON HYDRO PARTNERS	FULLERTON HYDRO PARTNERS	HYDROELECTRIC	HYDRO	HYDRO	PRESSURE-REDUCING STATION	0.4	NOT COGEN	0.4	12/20/86	SCE	ORANGE	LAMBERT & EUCLID	FULLERTON HYDRO PARTNERS	FULLERTON HYDRO PNRS
IRVINE RANCH WATER DISTRICT	A.K.A. TURTLE ROCK-QUAIL HILL	HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.191	NOT COGEN	0.191	4/1/84	SCE	ORANGE	UNIVERSITY OF YALE, 3512 MICHELSON DRIVE	IRVINE RANCH WATER DISTRICT	IRVINE RANCH WTR DIS
MUNICIPAL WATER DIST OF ORANGE COUNTY		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.6	NOT COGEN	0.6	3/30/92	SCE	ORANGE		MUNICIPAL WATER DISTRICT OF ORANGE CO	MWD OF ORANGE COUNTY
VALLEY VIEW		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	3.85	NOT COGEN	4.1	7/1/76	SCE	ORANGE	4229 VALLEY VIEW AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
YORBA LINDA FEEDER		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	5	NOT COGEN	5.1	11/1/81	SCE	ORANGE	3972 VALLEY VIEW AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
CORONA SMALL CONDUIT		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	3	NOT COGEN	2.9	8/1/83	SCE	RIVERSIDE	1980 ADOBE AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
SNOW CREEK		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER	0.3	NOT COGEN	0.3	2/2/88	SCE	RIVERSIDE	15100 SNOW CREEK	DESERT WATER AGENCY	DESERT WATER AGENCY
WHITEWATER		HYDROELECTRIC	HYDRO	HYDRO	RUN-OF-RIVER	1	NOT COGEN	1	4/11/86	SCE	RIVERSIDE	79 WHITEWATER CANYON DRIVE	DESERT WATER AGENCY	DESERT WATER AGENCY
LAKE HEMET MWD (NORTH FORK)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.65	NOT COGEN	0.65	6/21/84	SCE	RIVERSIDE	48850 HIGHWAY 74	LAKE HEMET MWD	LAKE HEMET MWD
LAKE MATHEWS	A.K.A. COLO AQUEDUCT	HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	5	NOT COGEN	4.9	8/1/80	SCE	RIVERSIDE	18250 LA SIERRA AVENUE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
PERRIS SMALL CONDUIT		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	8	NOT COGEN	7.9	5/1/83	SCE	RIVERSIDE	17801 LAKE PERRIS AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
SAN GORGONIO		HYDROELECTRIC	HYDRO	HYDRO		0.728	NOT COGEN		2/1/89	SCE	RIVERSIDE			CITY OF BANNING
SAN GORGONIO 1		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	1.5	NOT COGEN	1.5	12/1/23	SCE	RIVERSIDE		SCE	SCE
SAN GORGONIO 2		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.7	NOT COGEN	0.9	12/1/23	SCE	RIVERSIDE		SCE	SCE
SAN GORGONIO UPPER		HYDROELECTRIC	HYDRO	HYDRO		0.41	NOT COGEN		12/1/89	SCE	RIVERSIDE			CITY OF BANNING
TEMESCAL SMALL CONDUIT		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	3	NOT COGEN	2.9	7/1/83	SCE	RIVERSIDE	EAGLE CANYON ROAD	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
DEVIL CANYON	A.K.A. CEDAR SPRINGS	HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - CONVENTIONAL	280	NOT COGEN	276.6	12/1/72	SCE	SAN BERNARDINO	6900 DEVIL CANYON ROAD	CDWR	CDWR
ETIWANDA I		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	23.9	NOT COGEN	23.9	6/1/94	SCE	SAN BERNARDINO	8248 ETIWANDA AVE	METROPOLITAN WATER DISTRICT	METROPOLITAN WATER DISTRICT
FONTANA		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	1.9	NOT COGEN	3	12/1/17	SCE	SAN BERNARDINO		SCE	SCE
LYTLE CREEK		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.6	NOT COGEN	0.6	10/1/04	SCE	SAN BERNARDINO		SCE	SCE
MILL CREEK 1		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.9	NOT COGEN	0.8		SCE	SAN BERNARDINO		SCE	SCE
MILL CREEK 2		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.3	NOT COGEN	0.3	5/1/04	SCE	SAN BERNARDINO		SCE	SCE
MILL CREEK 3		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	2.7	NOT COGEN	3	3/1/03	SCE	SAN BERNARDINO		SCE	SCE
MOJAVE SIPHON		HYDROELECTRIC	HYDRO	HYDRO	HYDRAULIC TURBINE - PIPELINE	32.4	NOT COGEN	32.4	6/1/95	SCE	SAN BERNARDINO		CDWR	CDWR

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
MONTE VISTA WATER DISTRICT		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.865	NOT COGEN	0.865	8/5/90	SCE	SAN BERNARDINO	5501 ARROW HIGHWAY	MONTE VISTA WATER DISTRICT	MONTE VISTA WTR DIST
ONTARIO 1		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.9	NOT COGEN	0.6	12/1/02	SCE	SAN BERNARDINO		SCE	SCE
ONTARIO 2		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	0.3	NOT COGEN	0.3	6/1/63	SCE	SAN BERNARDINO		SCE	SCE
PARKER (USBR)		HYDROELECTRIC	HYDRO	HYDRO	HYDRO,WATER	120	NOT COGEN	120	12/1/42	PG&E	SAN BERNARDINO		USBR	USBR
SAN BERNARDINO MWD (SITE 1720)		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.178	NOT COGEN	0.178	7/1/83	SCE	SAN BERNARDINO	WEST OF CAJON AND NORTH OF DEVORE ROAD	SAN BERNARDINO MWD.	SAN BERNARDINO MWD.
SANTA ANA 1		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	3.8	NOT COGEN	3.2		SCE	SAN BERNARDINO		SCE	SCE
SANTA ANA 2		HYDROELECTRIC	HYDRO	HYDRO		1.4	NOT COGEN	0.8	5/1/05	SCE	SAN BERNARDINO		SCE	SCE
SANTA ANA 3		HYDROELECTRIC	HYDRO	HYDRO	HYDRO, WATER	3.1	NOT COGEN	3.1	4/1/47	SCE	SAN BERNARDINO		SCE	SCE
SIERRA		HYDROELECTRIC	HYDRO	HYDRO		0.8	NOT COGEN	0.4	1/1/22	SCE	SAN BERNARDINO		SCE	SCE
WFA STATION 1		HYDROELECTRIC	HYDRO	HYDRO	P.R. STATION	0.224	NOT COGEN	0.224	8/26/94	SCE	SAN BERNARDINO			WATER FACILITY AUTH-A JPA
SPRINGVILLE HYDRO STATION/CALLEGU		HYDROELECTRIC	HYDRO	HYDRO	HYDRO	1	NOT COGEN	1	3/17/94	SCE	VENTURA	600 VILLA ZAMORA		CALLEGUAS MWD
CONEJO HYDRO STATION/CALLEGUAS MU		HYDROELECTRIC	HYDRO	HYDRO	PRESSURE-REDUCING STATION	0.55	NOT COGEN	0.55	10/1/82	SCE	VENTURA	2100 OLSEN ROAD	CALLEGUAS MWD	CALLEGUAS MWD
SANTA ROSA HYDRO STATION/CALLEGUA		HYDROELECTRIC	HYDRO	HYDRO	PRESSURE-REDUCING STATION	0.25	NOT COGEN	0.25	7/1/76	SCE	VENTURA	SANTA ROSA ROAD	CALLEGUAS MWD	CALLEGUAS MWD
CAMROSA COUNTY WATER DISTRICT		HYDROELECTRIC	HYDRO	HYDRO	GAS-FUELED RECIPROCATING ENGINE	0.15	NOT COGEN	0.15	6/11/87	SCE	VENTURA	WOODCREEK ROAD AND UPLAND ROAD	CAMROSA COUNTY WATER DIST.	CAMROSA COUNTY W. D.
SANTA FELICIA		HYDROELECTRIC	HYDRO	HYDRO	SMALL HYDRO IMPROVEMENT PROJECT	0.935	NOT COGEN	0.935	6/1/87	SCE	VENTURA		UNITED WATER CONSERVATION DISTRICT	UNITED WATER CONSERVATION DISTRICT
DEL RANCH LTD. (NILAND #2)	A.K.A. DEL RANCH, LTD. (NILAND #2)	GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	38	NOT COGEN	42	5/1/86	SCE	IMPERIAL	7029 GENTRY ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
ELMORE LTD	A.K.A. ELMORE, LTD. (NILAND #3)	GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	38	NOT COGEN	42	12/11/90	SCE	IMPERIAL	786 WEST SINCLAIR ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
GEM RESOURCES, LLC		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE FLASH	20	NOT COGEN	40	6/1/89	SCE	IMPERIAL	3300 EAST EVAN HEWES HWY (8 MILES E OF HOLTVILLE & 1 MILE N OF I-8)	MISSION OPERATIONS & MAINTENANCE	GEO EAST MESA LIMITED PARTNERSHIP
GEM RESOURCES, LLC		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE FLASH	20	NOT COGEN	40	6/1/89	SCE	IMPERIAL	3300 EAST EVAN HEWES HWY (8 MILES E OF HOLTVILLE & 1 MILE N OF I-8)	MISSION OPERATIONS & MAINTENANCE	GEO EAST MESA LIMITED PARTNERSHIP
HEBER GEOTHERMAL COMPANY	HEBER FIELD COMPANY	GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	47	NOT COGEN	52	8/1/85	SCE	IMPERIAL	895 PITZER ROAD	OGDEN GEOTHERMAL OPERATIONS	CALPINE/ERC
LEATHERS L.P.	A.K.A LEATHERS,L.P.(NILAND #4)	GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	38	NOT COGEN	42	11/7/89	SCE	IMPERIAL	342 WEST SINCLAIR ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
ORMESA GEOTHERMAL II		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	BINARY CYCLE	18.5	NOT COGEN	18.5	12/31/87	SCE	IMPERIAL	3304 E. EVAN HEWES HIGHWAY	ORMESA OPERATORS	FPL ENERGY, INC.
SALTON SEA #1		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	SINGLE-FLASH CYCLE	10	NOT COGEN	10	7/1/87	SCE	IMPERIAL	6920 LACK ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
SALTON SEA POWER GENERATION LP #2		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	SINGLE-FLASH CYCLE	20	NOT COGEN	20	3/9/90	SCE	IMPERIAL	6920 LACK ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
SALTON SEA POWER GENERATION LP #3		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	49.8	NOT COGEN	49.8	1/3/89	SCE	IMPERIAL	6922 CRUMMER ROAD (& KUNS ROAD, SW OF NILAND, SALTON SEA)	CALIFORNIA ENERGY COMPANY	CALENERGY
SECOND IMPERIAL GEOTHERMAL		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	37	NOT COGEN	37	6/21/93	SCE	IMPERIAL	855 DOGWOOD RD	OGDEN SIGC GEOTHERMAL OPERATIONS	OGDEN POWER CORPORATION
VULCAN/BN GEOTHERMAL		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	DOUBLE-FLASH CYCLE	34	NOT COGEN	34.5	12/6/85	SCE	IMPERIAL	7001 GENTRY ROAD	CALIFORNIA ENERGY COMPANY	CALENERGY
ORMESA I, IE, IH		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	BINARY CYCLE	24	NOT COGEN	38	12/1/86	SCE	IMPERIAL	3300 E. EVAN HEWES HIGHWAY	PSC GEOTHERMAL SERVICES COMPANY	OESI POWER CORPORATION
ORMESA IE		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	BINARY CYCLE	38	NOT COGEN	38	12/15/86	SCE	IMPERIAL	3300 E. EVAN HEWES HIGHWAY	PSC GEOTHERMAL SERVICES COMPANY	OESI POWER CORPORATION
ORMESA IH		GEOTHERMAL	GEOTHERMAL	HYDROTHERMAL	BINARY CYCLE	6.5	NOT COGEN	13.2	12/1/89	SCE	IMPERIAL	3300 E. EVAN HEWES HIGHWAY	PSC GEOTHERMAL SERVICES COMPANY	OESI POWER CORPORATION
FALCON FOAM PLASTICS		WTE	MSW	INDUSTRIAL WASTE	COMBUSTION TURBINE/TOPPING CYCLE	0.365	COGEN	0.365	3/5/90	SCE	LOS ANGELES	14110 TOWN AVE.	FALCON FOAM PLASTICS	FALCON FOAM PLASTICS
BIOGEN POWER I		WTE	MSW	INDUSTRIAL WASTE	INDUSTRIAL WASTE	16	NOT COGEN	18.6	1/26/88	SCE	SAN BERNARDINO	72 YATES WELL-15	BIOGEN POWER COMPANY	BIOGEN POWER COMPANY
PUENTE HILLS ENERGY RECOVERY A	PUENTE HILLS (GAS TURBINES)	WTE	LANDFILL GAS	LANDFILL GAS	GAS TURBINE	4	NOT COGEN	3.9	11/22/83	SCE	LOS ANGELES	2800 WORKMAN MILL ROAD	L.A. COUNTY SANITATION DISTRICT	L.A. COUNTY SANITATION DISTRICT
PUENTE HILLS ENERGY RECOVERY B	PUENTE HILLS (STEAM CYCLE PLANT)	WTE	LANDFILL GAS	LANDFILL GAS	STEAM TURBINE	50	NOT COGEN	50	8/8/86	SCE	LOS ANGELES	2800 WORKMAN MILL ROAD	L.A. COUNTY SANITATION DISTRICT	L.A. COUNTY SANITATION DISTRICT
SPADRA LANDFILL		WTE	LANDFILL GAS	LANDFILL GAS	STEAM TURBINE	8	NOT COGEN	8	2/21/90	SCE	LOS ANGELES	4125 W. VALLEY BLVD	L.A. COUNTY SANITATION DISTRICT	CA POLYTECHNIC POMONA

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
PALOS VERDES ENERGY RECOVERY FROM	PALOS VERDES LF	WTE	LANDFILL GAS	LANDFILL GAS	RECIPROCATING ENGINE	13	NOT COGEN	13	5/20/88	SCE	LOS ANGELES	25704 HAWTHORNE BLVD	L.A. COUNTY SANITATION DISTRICT	L.A. COUNTY SANITATION DISTRICT
RIO HONDO COMMUNITY COLLEGE DISTRICT		WTE	LANDFILL GAS	LANDFILL GAS	GAS FUELED RECIPROCATING ENGINE	0.45	COGEN		3/1/88	SCE	LOS ANGELES	3600 WORKMAN MILL RD	RIO HONDO COMMUNITY COLLEGE DIS	RIO HONDO COMM. COLLEGE DIST.
MM WEST COVINA LLC 1		WTE	LANDFILL GAS	LANDFILL GAS	LANDFILL GAS	6.5	NOT COGEN		1/1/93	LADWP	LOS ANGELES	2210 S. AZUSA AVE		
MM WEST COVINA LLC 2		WTE	LANDFILL GAS	LANDFILL GAS	LANDFILL GAS	6.8	NOT COGEN		1/1/99	LADWP	LOS ANGELES	2210 S. AZUSA AVE		
PRIMA DESHECHA LANDFILL		WTE	LANDFILL GAS	LANDFILL GAS	RECIPROCATING ENGINE	9	NOT COGEN	6	3/15/99	SDG&E	ORANGE	32250 LA PATA AVENUE	ORANGE COUNTY I.W.M.	ORANGE COUNTY I.W.M.
COYOTE CANYON FACILITY - GAS RECO		WTE	LANDFILL GAS	LANDFILL GAS	STEAM TURBINE	20	NOT COGEN	20	2/8/89	SCE	ORANGE	5531 COYOTE CANYON DRIVE	ORANGE COUNTY IWMD	ORANGE COUNTY IWMD
OXNARD LANDFILL	BAILARD LF	WTE	LANDFILL GAS	LANDFILL GAS	RECIPROCATING ENGINE	5.625	NOT COGEN	5.625	12/15/85	SCE	VENTURA	2501 NORTH VENTURA ROAD	J & C PROPERTIEAL	J & C PROPERTIES, ET AL.
CHIQUITA WATER RECLAMATION	SANTA MARGARITA WATER DISTRICT	OIL/GAS	OIL/GAS	METHANE	RECIPROCATING	0.27	NOT COGEN	0.27	3/1/88	SDG&E	ORANGE	28793 ORTEGA HWY.		SANTA MARGARITA WATER DISTRICT
CITY OF LONG BEACH (SERRF)	SOUTHEAST RESOURCE RECOVERY FACILITY	WTE	MSW	MSW	MUNICIPAL SOLID WASTE	34.6	NOT COGEN	34.6	7/4/88	SCE	LOS ANGELES	120 HENRY FORD AVENUE	CITY OF LONG BEACH	SOUTHEAST RR AUTHORITY
PENROSE POWER STATION		WTE	MSW	MSW	RECIPROCATING ENGINE	12	NOT COGEN	12	5/12/86	SCE	LOS ANGELES	8301 TUJUNGA AVENUE	P.L.E.S.	OGDEN ENERGY GROUP, INC.
TOYON CANYON LANDFILL	TOYON POWER STATION	WTE	MSW	MSW	RECIPROCATING ENGINE	12	NOT COGEN	12	5/12/86	SCE	LOS ANGELES	5050 MOUNT HOLLYWOOD DRIVE (GRIFFITH PARK)	P.L.E.S.	OGDEN ENERGY GROUP, INC.
MINNESOTA METHANE (BKKI)	MM WEST COVINA LLC 1 or BKK LANDFILL PHASE I	WTE	MSW	MSW	LANDFILL GAS RECOVERY, STEAM TURBINE	3.25	NOT COGEN	6.5	10/5/93	SCE	LOS ANGELES	2210 SOUTH AZUSA AVENUE	BKK CORPORATION	BKK CORPORATION
MINNESOTA METHANE (BKKII)	BKK LANDFILL II or MM WEST COVINA LLC II	WTE	MSW	MSW	LANDFILL GAS RECOVERY, STEAM TURBINE	6	NOT COGEN	6.5	10/5/98	SCE	LOS ANGELES	2210 SOUTH AZUSA AVENUE	BKK CORPORATION	BKK CORPORATION
MINNESOTA METHANE (LOPEZ)	CITY OF L.A. LOPEX CANYOU LANDFILL	WTE	MSW	MSW	RECIPROCATING ENGINE	6	NOT COGEN	6	1/5/99	SCE	LOS ANGELES	11950 LOPEZ CANYON ROAD		MINNESOTA METHANE
OLINDA POWER	OLINDA ALPHA SLF	WTE	MSW	MSW	RECIPROCATING ENGINE	5.625	NOT COGEN	5.625	10/25/84	SCE	ORANGE	1942 VALENCIA BLVD	ORANGE COUNTY IWMD	ORANGE COUNTY IWMD
O'BRIEN ENERGY SYSTEMS, INC. (COR		WTE	MSW	MSW	LANDFILL GAS RECOVERY	5.2	NOT COGEN	5.2	3/4/86	SCE	RIVERSIDE	1300 MAGNOLIA AVENUE	OBRIEN ENERGY SYSTEMS INC	O'BRIEN ENERGY SYSTEM
MINNESOTA METHANE (HIGHGROVE)	CITY OF L.A. LOPEX CANYOU LANDFILL or HIGHGRIVE SLF	WTE	MSW	MSW	REIPROCATING ENGINE	0.95	NOT COGEN	0.95	12/1/98	SCE	RIVERSIDE	1420 HIGHGROVE DUMP ROAD	RIVERSIDE COUNTY WMD	RIVERSIDE COUNTY WMD
EL CENTRO	EL CENTO #1-#4	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, COMBINED CYCLE	239.7	NOT COGEN	256	6/1/49	IID	IMPERIAL	485 EAST VILLA ROAD	IID	IID
ROCKWOOD		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE	46	NOT COGEN	50	6/1/79	IID	IMPERIAL	4195 DOGWOOD ROAD	IID	IID
AES PLACERITA		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE TOPPING CYCLE	110	COGEN	110	3/1/86	SCE	LOS ANGELES	20885 PLACERITA CANYON ROAD	AES PLACERITA INC	AES CORPORTATION, APPLIED ENERGY SERVICE
AMERICAN PRIVATE VENTURES - QUEEN MARY		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	1	CC		3/30/89	SCE	LOS ANGELES	1256 PIER LONG BEACH	AMERICAN PRIVATE POWER	WRATHER PORT PRPTIES
ANDERSON LITOGRAPH COMPANY		OIL/GAS	OIL/GAS	NATURAL GAS	GAS TURBINE COMBINED CYCLE	5	COGEN	5	7/19/95	SCE	LOS ANGELES	6802 ACCO STREET		
PLACERITA UNIT I	A.K.A. ARCO OIL & GAS COMPANY- PLACERITA I OR ARCO PLACERITA COGEN 1	OIL/GAS	OIL/GAS	NATURAL GAS	I.C. TOPPING CYCLE	21.76	COGEN	21.76	12/1/85	SCE	LOS ANGELES	25121 N.SIERRA HIGHWAY	ARCO	ARCO
PLACERITA UNIT II	A.K.A. ARCO OIL & GAS COMPANY- PLACERITA II OR ARCO PLACERITA COGEN 2	OIL/GAS	OIL/GAS	NATURAL GAS	I.C. TOPPING CYCLE	21.76	COGEN	21.76	12/1/85	SCE	LOS ANGELES	25121 N.SIERRA HIGHWAY	ARCO	ARCO WESTERN ENERGY
ARCO PETROLEUM PRODUCTS COMPANY		OIL/GAS	OIL/GAS	NATURAL GAS	CATALYTIC CRACKER BOTTOMING CYCLE	8	COGEN	8	5/1/85	SCE	LOS ANGELES	1801 EAST SUPULVEDA BLVD	ARCO PETROLEUM PRODUCTS	ACRO PETROLEUM PRODUCTS
WATSON COGEN		OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	385	COGEN	385	12/4/87	SCE	LOS ANGELES	22850 SOUTH WILMINGTON AVENUE	WATSON COGENERATION	WATSON COGENERATION COMPANY
BENTLEY MILLS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.8	COGEN			SCE	LOS ANGELES	14641 E. DON JULIAN ROAD	BENTLEY MILLS	BENTLEY MILLS
BIOLA UNIVERSITY		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	1.124	COGEN	1.124	4/11/90	SCE	LOS ANGELES	13800 BIOLA AVE.	BIOLA UNIVERSITY	BIOLA UNIVERSITY
BIXBY KNOLLS TOWERS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.124	COGEN	0.124	2/13/95	SCE	LOS ANGELES	3747 ATLANTIC AVE		
BROADWAY		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE	162	NOT COGEN	155	1/1/55	PASADENA	LOS ANGELES	130 WALLIS	CITY OF PASADENA	CITY OF PASADENA
BURBANK	A.K.A. BURBANK COMBINED CYCLE	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE	42	NOT COGEN			BURBANK	LOS ANGELES	164 WEST MAGNOLIA BLVD		BURBANK
CAL POLY UNIVERSITY, POMONA		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.115	COGEN	0.115	9/3/87	SCE	LOS ANGELES	3801 W. TEMPLE AVE.	CAL POLY - POMONA	CAL POLY - POMONA
CSU LONG BEACH (DORM)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.15	COGEN		6/1/86	SCE	LOS ANGELES	5900 ATHERTON	CAL STATE LONG BEACH	CAL STATE LONG BEACH
CSU LONG BEACH (POOL)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.2	COGEN	0.2	5/31/87	SCE	LOS ANGELES	1401 PALO VERDE	CSULB PLANT OPERATIONS	CSU LONG BEACH
CARSON COGENERATION COMPANY	A.K.A. ICE HAUS , CARSON COGENERATION COMPANY	OIL/GAS	OIL/GAS	NATURAL GAS	GAS TURBINE COMBINED CYCLE	50.4	COGEN	50.4	1/1/80	SCE	LOS ANGELES	17171 SOUTH CENTRAL AVENUE	CARSON COGENERATION COMPANY	CARSON COGENERATION COMPANY
CERRITOS COLLEGE		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.15	COGEN	0.15	12/31/85	SCE	LOS ANGELES	11110 E. ALONDRA, NORWALK	CERRITOS COLLEGE	CERRITOS COLLEGE
EL SEGUNDO REFINERY #1		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TOPPING CYCLE	1.5	COGEN	1.5	11/15/76	SCE	LOS ANGELES	324 WEST EL SEGUNDO BLVD	CHEVRON U.S.A.	CHEVRON U.S.A.

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
EL SEGUNDO REFINERY III		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	48.2	COGEN	48.2	3/14/96	SCE	LOS ANGELES	324 WEST EL SEGUNDO BLVD	CHEVRON U.S.A.	CHEVRON PRODUCTS COMPANY/GOVT REPORTING
CITY OF LONG BEACH (BELMONT PLAZA POOL)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.12	COGEN	0.12	1/4/91	SCE	LOS ANGELES	4000 OLYMPIC PLAZA	CITY OF LONG BEACH	CITY OF LONG BEACH
CLAREMONT TENNIS CLUB		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.2	COGEN	0.2	7/14/88	SCE	LOS ANGELES	1777 PADUA AVE.	CLAREMON TENNIS CLUB	CLAREMON TENNIS CLUB
COGENIC - ERNE SANITARIUM		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	7/1/85	SCE	LOS ANGELES	527 W. REGENT STREET	ST ERNE SANITARIUM	ST ERNE SANITARIUM
JEFFERSON SMURFIT CORPORATION	A.K.A. CCOA VERNON COGEN	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	40	COGEN	40	12/31/85	SCE	LOS ANGELES	201 E. 57TH STREET	CONTAINER CORP OF AMERICA	JEFFERSON SMURFIT CORP.
COTIJA CHEESE		OIL/GAS	OIL/GAS	NATURAL GAS	COGENERATION	0.12	COGEN	0.12	5/4/95	SCE	LOS ANGELES	15130 EAST NELSON AVE		
PITCHESS COGEN	PITCHESS HONOR RANCH	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	28.709	COGEN	28.709	7/14/88	SCE	LOS ANGELES	29300 THE OLD ROAD	COUNTY OF LOS ANGELES	PITCHESS COGEN, LOS ANGELES COUNTY-ISD
DECOGEN	A.K.A. TAZCOGEN	OIL/GAS	OIL/GAS	NATURAL GAS	NATURAL GAS	0.5	COGEN	0.5	4/28/94	SCE	LOS ANGELES	444 NASH ST. (& GRANT STREET)		
EL SEGUNDO	EL SEGUNDO #1-#4	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE	1020	NOT COGEN	996.5	5/1/55	SCE	LOS ANGELES	301 VISTA DEL MAR	NRG/NORTHERN STATES POWER CO.	NRG/DESTEC
N.P. COGENERATION, INC	A.K.A. FPB COGENERATION PARTNERS, L.P.	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	24.7	COGEN	24.7	11/29/82	SCE	LOS ANGELES	5605 EAST 61ST STREET	FPB COGEN INC	GE CONTRACTUAL SERVICES
GLENARM	A.K.A. GLENARM #1-#2	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE	60.8	NOT COGEN	57.8	1/1/55	PASADENA	LOS ANGELES	45 EAST GLENARM AVENUE	CITY OF PASADENA	CITY OF PASADENA
GRAYSON		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM & COMBUSTION TURB, COMBINED CYCLE	272.5	NOT COGEN	282.5	4/1/41	GLENDALE	LOS ANGELES	634 BEKINS WAY	CITY OF GLENDALE	CITY OF GLENDALE
GREAT WESTERN MALTING COMPANY		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.75	COGEN	0.75	1/3/95	SCE	LOS ANGELES	5945 MALT AVE.		
HARBOR	A.K.A. HARBOR #6 -#9	OIL/GAS	OIL/GAS	NATURAL GAS	GAS TURBINE, NATURAL GAS	364	COGEN	373.5	1/1/54	LADWP	LOS ANGELES	161 N. ISLAND AVENUE	HARBOR COGENERATION CO	LADWP
HARBOR COGENERATIION	A.K.A. CHAMPLIN; HARBOR COGENERATION PROJECT	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE TOPPING CYCLE	80	COGEN	80	1/1/90	SCE	LOS ANGELES	420 HENRY FORD AVENUE	HARBOR COGENERATION CO	HARBOR COGENERATION COMPANY
HAYNES	A.K.A. HAYNES #1-#6	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, NATURAL GAS	1570	NOT COGEN	1606	1/1/66	LADWP	LOS ANGELES	6801 WESTMINSTER AVENUE	LADWP	LADWP
HENRY MAYO NEWHALL MEMORIAL HOSPITAL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.45	COGEN	0.45	2/23/87	SCE	LOS ANGELES	23845 W. MC BEAN PARKWAY	HENRY MAYO NEWHALL MEMORIAL	HENRY MAYO NEWHALL MEMORIAL
LA CANADA USD (LA CANADA SCHOOL)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.12	COGEN	0.12	9/15/87	SCE	LOS ANGELES	4463 OAK GROVE DRIVE	LA CANADA UNIFIED SCHOOLS	
LONG BEACH	LONG BEACH #8-#9	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE, STEAM TURBINE	530	NOT COGEN	586.5	1/1/76	SCE	LOS ANGELES	2665 WEST SEASIDE BLVD, TERMINAL ISLAND	NRG/NORTHERN STATES POWER CO.	NRG/DESTEC
LUNDY (THAGARD OIL)		OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	1.4	COGEN	1.4	4/15/91	SCE	LOS ANGELES	9301 SOUTH GARFIELD AVENUE	EUA/ONSITE COGEN L.P.	LUNDAY THAGARD CO.
MAGNOLIA		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, COMBINED CYCLE	81.7	NOT COGEN	87.6	1/1/49	BURBANK	LOS ANGELES	164 WEST MAGNOLIA BLVD	CITY OF BURBANK	CITY OF BURBANK
METAL SURFACES		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.35	COGEN	0.35	6/9/93	SCE	LOS ANGELES	6060 SHULL STREET	METAL SURFACES, INC.	
MICRO UTILITY (FOSS PLANTING)	MICRO UTILITY PARTNERS OF AMERICA (FOSS PLANTING)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	7/11/88	SCE	LOS ANGELES	8140 SECURA WAY	MICRO UTILITY PARTNERS OF AMERICA	FOSS PLATING INC.
MICRO UTILITY (QUAKER)	MICRO UTILITY PARTNERS OF AMERICA (QUAKER)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	12/29/87	SCE	LOS ANGELES	7937 CHATFIELD	MICRO UTILITY PARTNERS OF AMERICA	TRAIN JOHNSON POWER
MICRO UTILITY (SAFE PLANTING)	MICRO UTILITY PARTNERS OF AMERICA (SAFE PLTG)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	8/15/88	SCE	LOS ANGELES	18001 RAILROAD STREET	MICRO UTILITY PARTNERS OF AMERICA	TRAIN JOHNSON POWER
TORRANCE REFINERY		OIL/GAS	OIL/GAS	NATURAL GAS	CT/INDUSTRIAL TOPPING CYCLE	41.9	COGEN	42	5/1/83	SCE	LOS ANGELES	3700 WEST 190TH STREET	MOBIL OIL COMPANY	MOBIL OIL COMPANY
MT. SAN ANTONIO GARDENS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.12	COGEN		1/1/85	SCE	LOS ANGELES	900 E. HARRISON AVE	MT SAN ANTONIO GARDENS	MT. SAN ANTONIO GDN.
O'BRIEN CALIFORNIA COGEN (CAL MILK)	A.K.A. CALIFORNIA MILK PRODUCERS	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	35	COGEN	35	8/20/89	SCE	LOS ANGELES	17306 FALLON AVENUE	O'BRIEN CALIFORNIA COGEN LTD	O'BRIEN CALIFORNIA COGEN LTD
OLIVE		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, GAS TURBINE	152.5	NOT COGEN	172	1/1/59	BURBANK	LOS ANGELES	164 WEST MAGNOLIA BLVD	CITY OF BURBANK	CITY OF BURBANK
PAPER PAK PRODUCTS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	1.4	COGEN	1.4	10/1/84	SCE	LOS ANGELES	1941 WHITE AVENUE	PAPER PAK PRODUCTS	PAPER PAK PRODUCTS
PETROMINERALS CORPORATION	PETROMINERALS CORPORATION	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.5	COGEN	0.5	6/24/86	SCE	LOS ANGELES	29007 1/2 HASLEY CANYON RD	PETROMINERALS CORP	PETROMINERALS CORP
POMONA POWER FACILITY		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	3.3	COGEN	3.3	10/4/87	SCE	LOS ANGELES	800 E. BONITA AVENUE	A. JOHNSON, ENERGY DEV INC	POMONA G P INC
POMONA VALLEY COMMUNITY HOSPITAL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.8	COGEN	0.8	2/15/87	SCE	LOS ANGELES	1798 NORTH GAREY AVENUE	POMONA VALLEY COMMUNITY HOSPITAL	POMONA VALLEY COMMUNITY HOSPITAL
PRESBYTERIAN INTERCOMMUNITY HOSPITAL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.48	COGEN		11/9/83	SCE	LOS ANGELES	12102 WASHINGTON BLVD.	PRESBYTERIAN INTERCOMM. HOSPITA	PRESBYTERIAN INTERCOMM. HOSPITAL
REDONDO BEACH GENERATING STAT	REDONDO #1-#8	OIL/GAS	OIL/GAS	NATURAL GAS		1310	NOT COGEN	1579.45	1/1/48	SCE	LOS ANGELES	1100 HARBOR DRIVE	SCE	AES CORP.
RHONE-POULENC (DOMINGUEZ PLANT)	RHONE-POULENC BASIC CHEMICALS CO.	OIL/GAS	OIL/GAS	NATURAL GAS	PROCESS STEAM PLANT/BOTTOMING CYCLE	4.9	COGEN	5	8/6/76	SCE	LOS ANGELES	20720 SOUTH WILMINGTON AVE	RHONE-POULENC BASIC CHEMICALS	RHONE-POULENC BASIC CHEMICALS

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
SANTA MONICA BAY HOTEL		OIL/GAS	OIL/GAS	NATURAL GAS	CT/INDUSTRIAL TOPPING CYCLE	0.95	COGEN	0.95	11/17/89	SCE	LOS ANGELES	1700 OCEAN AVENUE	SANTA MONICA HOTEL ASSOC LTD	LOEWS SANTA MONICA BEACH HOTEL
SCATTERGOOD	SCATTERGOOD #1-#3	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, NATURAL GAS	803	NOT COGEN	823.2	12/1/58	LADWP	LOS ANGELES	12700 VISTA DEL	LADWP	LADWP
SAN GABRIEL COGEN	SIMPSON PAPER COMPANY or SAN GABRIEL MILL	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	36	COGEN	36	11/18/85	SCE	LOS ANGELES	100 NORTH ERIE STREET	SIMPSON PAPER COMPANY	TRACTEBEL ELECTRICITY & GAS
SMURFIT POMONA MILL	SMURFIT NEWSPRINT CORPORATION	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	12	COGEN	12	6/1/85	SCE	LOS ANGELES	2205 WEST MT. VERNON AVENUE	GARDEN STATE NEWSPRINT	SMURFIT NEWSPRINT CORP.
SOUTHERN CALIFORNIA GAS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.55	COGEN	0.55	10/30/87	SCE	LOS ANGELES	1801 S. ATLANTIC BLVD.	TULARE CO CORRECTIONAL CENTER	SO.CALIF.GAS CO.
ST. JOHN'S HOSPITAL AND HEALTH CENTER		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	1.08	COGEN	1.08	2/5/92	SCE	LOS ANGELES	1328 22ND STREET	ST. JOHN'S HOSPITAL & HEALTH CENTER	ST.JOHN'S HOSPITAL &HEALTH CTR
COLDGEN; SUNLAW COGEN #1	FEDERAL COGENERATION PLANT	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	56	COGEN	56	5/1/84	SCE	LOS ANGELES	4151 EAST FRUITLAND AVENUE	SUNLAW ENERGY CORP/COGEN PARTNERSHIP	SUNLAW ENERGY CORP/COGEN PARTNERSHIP
THE EPISCOPAL HOME		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.2	COGEN	0.2	1/1/86	SCE	LOS ANGELES	1428 S. MARENGO	J.A. TRENT & ASSOCIATES	THE EPISCOPAL HOME
THE FORUM #1		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.115	COGEN	0.115	4/1/85	SCE	LOS ANGELES	3900 W. MANCHESTER	THE FORUM	THE FORUM
VALLEY	VALLEY #1-#4	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, NATURAL GAS	517	NOT COGEN	545.6	1/1/54	LADWP	LOS ANGELES	9430 SAN FERNANDO ROAD	LADWP	LADWP
VANGUARD (ELECTRONIC PLATING)	A.K.A. VANGUARD/ ELECTRONIC PLATING	OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	2/1/98	SCE	LOS ANGELES	13021 S. BUDLONG AVE	VANGUARD/ELECTRONIC PLATING	VANGUARD/ELECTRONIC PLATING
VERNON		OIL/GAS	OIL/GAS	NATURAL GAS	INTERNAL COMBUSTION	30.6	NOT COGEN	41.8	1/1/33	VERNON	LOS ANGELES	2715 E 50TH ST	VERNON MUNICIPAL LIGHT DEPT.	CITY OF VERNON
WHEELABRATOR NORWALK ENERGY COMPANY	A.K.A. METROPOLITAN STATE HOSPITAL	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	29	COGEN	29	9/10/87	SCE	LOS ANGELES	11500 S. NORWALK BLVD	WHEELABRATOR NORKWALK EGY CO	WHEELABRATOR NORKWALK EGY CO
WHITTIER UHSD (LA SERNA HIGH SCHOOL)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.1	COGEN		1/4/90	SCE	LOS ANGELES	15301 EAST YOUNGWOOD (& LA SERNA RD)	LA SERNA HIGH SCHOOL	LA SERNA HIGH SCHOOL
COLDGEN; SUNLAW COGEN #2	U.S. GROWERS COGENERATION PLANT	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	56	COGEN	28.5	1/1/86	SCE	LOS ANGELES	3470 EAST VERNON AVENUE	SUNLAW ENERGY CORP/COGEN PARTNERSHIP	SUNLAW ENERGY CORP/COGEN PARTNERSHIP
CBS STUDIOS		OIL/GAS	OIL/GAS	NATURAL GAS		1.4	COGEN	1.4	1/1/88	PG&E	LOS ANGELES	7800 BEVERLY BLVD.	ONSITE ENERGY, CORP.	
CALIFORNIA INSTITUTE OF TECHNOLOGY	A.K.A. CAL-TECH	OIL/GAS	OIL/GAS	NATURAL GAS		4.2	COGEN	5.3	3/1/84	SCE	LOS ANGELES	950 SOUTH WILSON ST		CALIFORNIA INSTITUTE OF TECHNOLOGY
CIVIC CENTER COGENERATION		OIL/GAS	OIL/GAS	NATURAL GAS		26.4	COGEN	26.4	5/1/88	SCE	LOS ANGELES	301 NORTH BROADWAY		
ST. LUKE MEDICAL CENTER		OIL/GAS	OIL/GAS	NATURAL GAS		1	COGEN	1	1/1/83	SCE	LOS ANGELES	2632 EAST WASHINGTON BLVD.		ORNDNA HEALTH CORPORATION
UCLA SOUTH CAMPUS CENTRAL CHILLER COGEN		OIL/GAS	OIL/GAS	NATURAL GAS		30.4	COGEN	30.4	4/1/90	SCE	LOS ANGELES	405 HILGUARD AVENUE	PARSONS MAIN, INCORPORATED	UCLA REGENTS
UCLA COGENERATION	A.K.A. SOUTH CAMPUS CENTRAL CHILLER COGEN	OIL/GAS	OIL/GAS	NATURAL GAS		43	COGEN	43	1/6/94	SCE	LOS ANGELES	721 CIRCLE DRIVE SOUTH	PARSONS MUNICIPAL SERVICES	UCLA REGENTS
WILMINGTON COGENERATION		OIL/GAS	OIL/GAS	NATURAL GAS		28	COGEN	28.25	12/1/88	SCE	LOS ANGELES	2300 EAST PACIFIC COAST HWY		PRAXAIR INCORPORATED
TEXACO LOS ANGELES REFINERY EXPANSION (WILMINGTON)		OIL/GAS	OIL/GAS	NATURAL GAS		60	NOT COGEN	60	1/1/88	LADWP	LOS ANGELES	2101 EAST PACIFIC COAST HWY		EQUILON ENTERPRISES LLC, LA REFINING
ALL METALS PROCESSING OF ORANGE COUNTY		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.175	COGEN	0.175	10/5/94	SCE	ORANGE	8401 STANDUSTRIAL	ALL METALS PROCESSING COMPANY	
AMERICAN CORNERSTONE (HOLIDAY INN)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.15	COGEN	0.15	6/1/88	SCE	ORANGE	222 W. HOUSTON	G.G. FULLERTON HOLIDAY INN	INTEGRATED TOTAL EGY
AMERICAN MCGAW		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE & GAS TURBINE	8.6	COGEN		10/1/81	SCE	ORANGE	2525 MCGAW AVENUE (INTERSECTS: JAMBOREE RD)	AMERICAN MC GAW	AMERICAN MC GAW
AMERICAN MCGAW #2		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-TURBINE	6.1	COGEN	6.1	2/21/95	SCE	ORANGE	2525 MCGAW AVENUE (INTERSECTS: JAMBOREE RD)	AMERICAN MC GAW	AMERICAN MC GAW
ANAHEIM GAS TURBINE		OIL/GAS	OIL/GAS	NATURAL GAS	GAS TURBINE, NATURAL GAS	45.55	NOT COGEN	49.3	6/13/88	ANAHEIM	ORANGE	1144 N KRAEMER BLVD	ANAHEIM PUBLIC UTILTIES DEPT.	CITY OF ANAHEIM
PCA METAL FINISHING		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	12/15/94	SCE	ORANGE	1726 EAST ROSSLYNN AVE		
RED LION INN		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.46	COGEN	0.46	6/15/87	SCE	ORANGE	3050 BRISTOL	THUNDERBIRD/RED LION CORP	RED LION INN
ROYALTY CARPET MILLS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.425	COGEN	0.425	2/15/95	SCE	ORANGE	17352 DERIAN AVENUE		
SOUTHERN CALIFORNIA GAS (HYATT REGENCY)		OIL/GAS	OIL/GAS	NATURAL GAS	FUEL CELL/WASTEHEAT RECOVERY	0.2	COGEN	0.2	6/14/92	SCE	ORANGE	17900 JAMBOREE BLVD		
TURBINE TECH		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.15	COGEN	0.15	12/9/88	SCE	ORANGE	4700 1/2 SAN ANTONIO ROAD	FULLERTON UNIFIED SCHOOL DISTRICT	TURBINE TECHNOLOGY
UNOCAL RESEARCH	A.K.A. UNOCAL RESEARCH	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	3.623	COGEN	3.623	12/27/90	SCE	ORANGE	376 S. VALENCIA AVENUE	UNOCAL	UNOCAL
CES ENERGY ALBERHILL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.56	COGEN	0.56	5/4/91	SCE	RIVERSIDE	14741 LAKE STREET	COGENIC ENEGY SYSTEMS (CES) ALBERHILL, L	CES ALBERHILL, LTD

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
CES ENERGY CORONA (PACIFIC CLAY)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.6	COGEN	0.6	6/15/90	SCE	RIVERSIDE	20325 TEMESCAL CANYON ROAD	PACIFIC CLAY PRODUCTS	PACIFIC CLAY PRODUCTS
MUNICIPAL COGEN		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	1.3	COGEN	1.3	4/1/85	SCE	RIVERSIDE	205 NORTH EL CIELO	CITY OF PALM SPRINGS	CITY OF PALM SPRINGS
CITY OF PALM SPRINGS (SUNRISE PLAZA)		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.641	COGEN	0.65	6/13/85	SCE	RIVERSIDE	403 S. CERRITOS DRIVE	CITY OF PALM SPRINGS	CITY OF PALM SPRINGS
COACHELLA		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE, NATURAL GAS	80	NOT COGEN	92.8	6/1/73	IID	RIVERSIDE	1280 GRAPEFRUIT BLVD.	IID	IID
CORONA ENERGY PARTNERS	CORONA COGEN	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	42	COGEN	42	5/21/88	SCE	RIVERSIDE	1130 WEST RINCON STREET	CORONA ENERGY PARTNERS	CORONA ENERGY PARTNERS
EUA/FRCII (MONTEREY COUNTRY CLUB)	EUA/FRCII ENERGY ASSOCIATES (MONTEREY COUNTRY CLUB)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.115	COGEN	0.115	2/6/91	SCE	RIVERSIDE	41500 MONTEREY AVE.	THE MONTEREY COUNTRY CLUB	THE MONTEREY COUNTRY CLUB
EUA/FRCII (PALM VALLEY COUNTRY CLUB)	EUA/FRCII ENERGY ASSOCIATES (PALM VALLEY COUNTRY CLUB)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.41	COGEN	0.41	3/25/91	SCE	RIVERSIDE	39205 PALM VALLEY	J.A. TRENT & ASSOCIATES	THE PALM VALLEY C C
EUA/FRCII (VINTAGE COUNTRY CLUB)	A.K.A. EUA/FRCII ENERGY ASSOCIATES (VINTAGE COUNTRY CLUB)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.6	COGEN	0.06	7/12/91	SCE	RIVERSIDE	75001 VINTAGE DRIVE WEST		RIDGEWOOD POWER CORP
RIVERSIDE CANAL POWER COMPANY	A.K.A. HIGHGROVE	OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE	154	NOT COGEN	169	8/1/52	SCE	SAN BERNARDINO	12700 TAYLOR STREET	SCE	THERMO ECOTEK
INLAND PAPERBOARD & PACKAGING	A.K.A. ONTARIO MILL or INLAND CONTAINER CORPORATION	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	41.06	COGEN	41.06	1/1/25	SCE	SAN BERNARDINO	5101 JURUPA STREET	INLAND CONTAINER CORPORATION	INLAND CONTAINER CORPORATION
LOMA LINDA UNIVERSITY		OIL/GAS	OIL/GAS	NATURAL GAS	CT PROCESS STEAM PLANT/TOPPING	13.4	COGEN	13.4	4/1/80	SCE	SAN BERNARDINO	11100 ANDERSON ST	LOMA LINDA UNIVERSITY	LOMA LINDA UNIVERSITY
MCANALLY EGG RANCH		OIL/GAS	OIL/GAS	NATURAL GAS	NATURAL GAS	0.12	COGEN	0.12	1/1/94	SCE	SAN BERNARDINO			
MICRO UTILITY (LAKE ARROWHEAD HILTON)	MICRO UTILITY PARTNERS (LK. ARROWHEAD HILTON)	OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.28	COGEN	0.28	9/13/88	SCE	SAN BERNARDINO	27984 HIGHWAY 189	MICRO UTILITY PARTNERS OF AMERICA	LAKE ARROWHEAD HILTON
WESTEND	NORTH AMERICAN CHEMICAL COMPANY	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	15	COGEN	15	6/25/79	SCE	SAN BERNARDINO	13200 MAIN STREET	NORTH AMERICAN CHEMICAL CO	NORTH AMERICAN CHEMICAL CO.
INDECK ONTARIO COGEN	ONTARIO COGENERATION (SUNKIST)	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	12	COGEN	12	11/1/84	SCE	SAN BERNARDINO	705 EAST CALIFORNIA STREET	INTERNATIONAL POWER TECHNOLOGY	INDECK CAPITAL, INC.
RIALTO USD		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.1	COGEN	0.1	12/20/89	SCE	SAN BERNARDINO	1321 N. LILAC AVE.	EISENHOWER HIGH SCHOOL	EISENHOWER HIGH SCHOOL
RIMROCK VILLAGE PARTERSHIP		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.12	COGEN	0.12	11/1/89	SCE	SAN BERNARDINO	1801 RIMROCK	RIMROCK VILLAGE APARTMENTS	RIMROCK VILLAGE APARTMENTS
SAN ANTONIO COMMUNITY HOSPITAL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	1.744	COGEN	1.744	9/16/85	SCE	SAN BERNARDINO	999 SAN BARNARDINO ROAD	SAN ANTONIO COMMUNITY HOSPITAL	SAN ANTONIO COMMUNIT
MOUNTAINVIEW POWER CO. (SAN BERNARDINO)	SAN BERNARDINO	OIL/GAS	OIL/GAS	NATURAL GAS	STREAM TURBINE	126	NOT COGEN	130.56	1/1/57	SCE	SAN BERNARDINO	25770 SAN BERNARDINO AVENUE	SCE	THERMO ECOTEK
TRANSAMERICAN PLASTICS		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.34	COGEN			SCE	SAN BERNARDINO	5601 SANTA ANA ST.	TRANSAMERICAN PLASTICS	SAM CHEBIER
VICTOR VALLEY COMMUNITY HOSPITAL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS FUELED RECIPROCATING ENGINE	0.135	COGEN			SCE	SAN BERNARDINO	15248 11TH STREET	VICTOR VLY COMMUNITY HOSPITAL	VICTOR VALLEY HOSPIT
COOLWATER		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE, COMBINED CYCLE	628	NOT COGEN	726.9	1/1/72	SCE	SAN BERNARDINO	EAST SANTA FE STREET	RELIANT ENERGY	RELIANT ENERGY
DOUBLETREE HOTEL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.2	COGEN	0.2	11/3/89	SCE	VENTURA	2055 HARBOR BLVD.	DOUBLE TREE HOTEL	DOUBLE TREE HOTEL
OXNARD WWTP		OIL/GAS	OIL/GAS	NATURAL GAS	GAS TURBINE COMBINED CYCLE	1.5	COGEN	1.5	1/12/82	SCE	VENTURA	6001 SOUTH PERKINS ROAD	CITY OF OXNARD	CITY OF OXNARD
CITY OF VENTURA - EASTSIDE WTR RENOVATION		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.548	COGEN	0.548	4/2/92	SCE	VENTURA	1400 SPINNAKER DRIVE		CITY OF VENTURA
SITHE ENERGIES	A.K.A. OXNARD ENERGY FACILITY or E.F. OXNARD	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	48.5	COGEN	48.5	4/13/90	SCE	VENTURA	550 S. DIAZ AVENUE	E.F. OXNARD INC.	SITHE ENERGIES, INC.
CAMARRILLO NUG	O.L.S. ENERGY (CAMARILLO STATE HOSPITAL)	OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	28.04	COGEN	28.04	12/27/87	SCE	VENTURA	1947 WEST POTRERO ROAD	O.L.S. ACQUISITION	ENERGY INITIATIVES, INC.
ORMOND BEACH		OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE - STEAM TURBINE	1500	NOT COGEN	1612.8	1/1/71	SCE	VENTURA	6635 SOUTH EDISON DRIVE	RELIANT ENERGY	RELIANT ENERGY
OXNARD HIGH SCHOOL		OIL/GAS	OIL/GAS	NATURAL GAS	GAS-FUELED RECIPROCATING ENGINE	0.12	COGEN	0.12	5/29/90	SCE	VENTURA	937 W. 5TH STREET	OXNARD UNION HIGH SCHOOL DISTRI	OXNARD HIGH SCHOOL
PROCTER & GAMBLE (OXNARD) 1		OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	19.876	COGEN	19.876	1/1/84	SCE	VENTURA	800 NORTH RICE AVENUE	PROCTOR & GAMBLE	NATIONAL GAS & ELECTRIC
PROCTER & GAMBLE (OXNARD) 2		OIL/GAS	OIL/GAS	NATURAL GAS	COMBINED CYCLE/TOPPING CYCLE	49.9	COGEN	49.9	11/17/89	SCE	VENTURA	800 NORTH RICE AVENUE	PROCTOR & GAMBLE	PROCTER & GAMBLE
ROCKWELL INTERNATIONAL	A.K.A. SCTI/POWER PAK	OIL/GAS	OIL/GAS	NATURAL GAS	MISCELLANEOUS/ BOTTOMING CYCLE	28	COGEN		5/30/93	SCE	VENTURA	SECTION 1 FACILITY, BLDG. 355, WOOLSEY CANYON ROAD	ENERGY TECHNOLOGY ENGINEERING C	ROCKWELL INTERN'L
ROCKWELL INTERNATIONAL (KALINA)		OIL/GAS	OIL/GAS	NATURAL GAS	MISCELLANEOUS/ BOTTOMING CYCLE	3.5	COGEN		8/25/92	SCE	VENTURA	6633 CANOGA AVE.	ROCKWELL INTERNATIONAL	ROCKWELL INTERNATIONAL
US GOVERNMENT, NAVAL ENGINEERING COMMAND		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	0.8	COGEN		5/1/89	SCE	VENTURA	NAVAL RESERVATION, BUILDING 373	NAVAL FACILITIES ENGINEERING CO	NAVAL FACILITIES ENGINEERING COMMAND

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
UNOCAL RINCON COGENERATION PROJECT		OIL/GAS	OIL/GAS	NATURAL GAS	STEAM TURBINE/ENHANCED OIL RECOVERY	3.5	COGEN	3.5	2/20/92	SCE	VENTURA	5777 W. PACIFIC COAST HWY		UNOCAL
VINTAGE PETROLEUM		OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	3.3	COGEN	3.3	3/11/80	SCE	VENTURA	290 MAPLE COURT	CONOCO INC	CONOCO, INC.
HUENEME PAPER MILL	WILLIAMETTE INDUSTRIES	OIL/GAS	OIL/GAS	NATURAL GAS	COMBUSTION TURBINE/TOPPING CYCLE	25	COGEN	25	3/14/86	SCE	VENTURA	5936 PERKINS RD.	WILLIAMETTE INDUSTRIES INC	WILLIAMETTE INDUSTRIES INC
EL SEGUNDO REFINERY #2		OIL/GAS	OIL/GAS	NATURAL GAS, BUTANE	COMBUSTION TURBINE/TOPPING CYCLE	76.7	COGEN	76.7	12/29/87	SCE	LOS ANGELES	324 WEST EL SEGUNDO BLVD	CHEVRON U.S.A.	CHEVRON PRODUCTS COMPANY/GOVT REPORTING
CHINO NUG	O.L.S. ENERGY (CHINO MEN'S INSTITUTION)	OIL/GAS	OIL/GAS	NATURAL GAS, DIST	COMBINED CYCLE/TOPPING CYCLE	27.6	COGEN	27.75	12/24/87	SCE	SAN BERNARDINO	5601 EUCALYPTUS AVENUE	O.L.S. ENERGY	ENERGY INITIATIVES, INC.
LOS ANGELES REFINERY		OIL/GAS	OIL/GAS	NATURAL GAS, REFINER		54	COGEN	42.1	1/1/87	SCE	LOS ANGELES	1660 WEST ANAHEIM STREET		TOSCO REFINING CO.
ALAMITOS GENERATING STAT	A.K.A. ALAMITOS #1-#7, ALAMITOS	OIL/GAS	OIL/GAS	NATURAL, DISTILLATE	STEAM TURBINE, GAS TURBINE	2088	NOT COGEN	2120.53	9/1/56	SCE	LOS ANGELES	690 NORTH STUDEBAKER ROAD	SCE	AES CORP. c/o WILLIAMS
HUNTINGTON BEACH		OIL/GAS	OIL/GAS	NATURAL, DISTILLATE	STEAM TURBINE, COMBUSTION TURBINE	563	NOT COGEN	1008.53	6/1/58	SCE	ORANGE	21730 NEWLAND STREET	SCE	AES CORP.
ETIWANDA		OIL/GAS	OIL/GAS	NATURAL, DISTILLATE	STEAM TURBINE, COMBUSTION TURBINE	911	NOT COGEN	1049.13	7/1/53	SCE	SAN BERNARDINO	8996 ETIWANDA AVENUE	RELIANT ENERGY	RELIANT ENERGY
MANDALAY		OIL/GAS	OIL/GAS	NATURAL, DISTILLATE	STEAM TURBINE, COMBUSTION TURBINE	435	NOT COGEN	573.33	5/1/59	SCE	VENTURA	393 NORTH HARBOR BLVD.	RELIANT ENERGY	RELIANT ENERGY
SOUTHERN CALIFORNIA GAS (SCAQMD)		OIL/GAS	OIL/GAS	OIL/GAS	FUEL CELL/WASTEHEAT RECOVERY	0.2	COGEN	0.2	4/10/92	SCE	LOS ANGELES	21865 EAST COPLEY DRIVE		
ARCO C.Q.C. KILN	ARCO WILMINGTON CALCINER	COAL	COAL	PETROLEUM COKE	MISCELLANEOUS/BOTTOMING CYCLE	34	COGEN	34	1/7/89	SCE	LOS ANGELES	1175 CARRACK AVE.	ARCO WILMINGTON CALCINER	ARCO PRODUCTS CO.
CASTAIC		HYDROELECTRIC	HYDRO	PUMPED STORAGE	PUMPED STORAGE,WATER	1495	NOT COGEN	1331	2/9/72	LADWP	LOS ANGELES	37700 TEMPLILN HIGHWAY	LADWP	LADWP
COMMERCE REFUSE-TO-ENERGY		WTE	MSW	REFUSE-DERIVED	MUNICIPAL SOLID WASTE	12	NOT COGEN	12	1/1/54	SCE	LOS ANGELES	5926 SHEILA STREET	LOS ANGELES SANITATION DISTRICT	COMMERCE REFUSE TO ENERGY
SEGS 1 AND 2/SUNRAY ENERGY, INC.	A.K.A. DAGGETT LEASING CORPORATION (SEGS I)	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	43.8	NOT COGEN	43.8	11/2/84	SCE	SAN BERNARDINO	35100 EAST SANTA FE STREET	DAGGETT LEASING CORPORATION	LUZ SOLAR PTNRS II
LUZ SEGS II		SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	30	NOT COGEN		12/24/85	SCE	SAN BERNARDINO	35100 SANTA FE STREET	DAGGETT LEASING CORPORATION	LUZ SOLAR PTNRS II
SEGS 3, LUZ SOLAR PARTNERS LTD		SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	35	NOT COGEN	35	12/18/86	SCE	SAN BERNARDINO	41100 HIGHWAY 395	LUZ SOLAR PARTNERS III	KRAMER JUNCTION COMPANY
SEGS 4, LUZ SOLAR PARTNERS LTD		SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	35	NOT COGEN	35	12/23/86	SCE	SAN BERNARDINO	41100 HIGHWAY 395	LUZ SOLAR PARTNERS IV	KRAMER JUNCTION COMPANY
SEGS 9, LUZ SOLAR PARTNERS LTD	A.K.A. HARPER LAKE PLANT	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	80	NOT COGEN	80	10/11/90	SCE	SAN BERNARDINO	43880 HARPER DRY LAKE ROAD	LUZ ENGINEERING CORP.	LUZ SOLAR PARTNERS INC, LTD.
SEGS 5, LUZ SOLAR PARTNERS LTD	LUZ SEGS V	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	35	NOT COGEN	35	9/29/87	SCE	SAN BERNARDINO	41100 HIGHWAY 395	LUZ SOLAR PRTNERS V	KRAMER JUNCTION COMPANY
SEGS 6, LUZ SOLAR PARTNERS LTD	LUZ SEGS VI	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	35	NOT COGEN	35	12/25/88	SCE	SAN BERNARDINO	41100 HIGHWAY 395	LUZ SOLAR PARTNERS VI	KRAMER JUNCTION COMPANY
SEGS 7, LUZ SOLAR PARTNERS LTD	LUZ SEGS VII	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	35	NOT COGEN	35	12/29/88	SCE	SAN BERNARDINO	41100 HIGHWAY 395	LUZ SOLAR PARTNERS VII	KRAMER JUNCTION COMPANY
SEGS 8 - LUZ SOLAR PARTNERS LTD	A.K.A. HARPER LAKE PLANT	SOLAR	SOLAR	THERMAL	PARABOLIC TROUGH	80	NOT COGEN	80	12/29/89	SCE	SAN BERNARDINO	43880 HARPER DRY LAKE ROAD	LUZ ENGINEERING CORP.	HARPER LAKE COMPANY VIII
ALTA MESA POWER PURCHASE CONTRACT	A.K.A. SWANMILL FARMS I-II	WIND	WIND	WIND	WINDPARK	24.57	NOT COGEN	27	12/31/88	SCE	RIVERSIDE		SEAWEST INDUSTRIES, INC.	MARK TECHNOLOGIES CO
ALTECH III		WIND	WIND	WIND	WINDPARK	32.874	NOT COGEN	32.874	12/18/85	SCE	RIVERSIDE	62195 GARRET AVENUE	SEAWEST ENERGY GROUP	ALTECH ENERGY INC.
DIFWIND FARMS LTD V		WIND	WIND	WIND	WINDPARK	7.884	NOT COGEN	7.9	10/15/86	SCE	RIVERSIDE	63-665 19TH AVENUE	FORAS SERVICE CORP	DIFWIND PARTNERS
DIFWIND PARTNERS (DIFWIND FARMS L		WIND	WIND	WIND	WINDPARK	14.154	NOT COGEN	15.063	12/18/85	SCE	RIVERSIDE	62195 GARRET AVE	CORAM	ENERGY CONVERSION TE
EUI MANAGEMENT PH, INC.		WIND	WIND	WIND	WINDPARK	25.535	NOT COGEN	25.535	12/31/85	SCE	RIVERSIDE		EUI MANAGEMENT PH, INC/ENERGY UNLIMITED	FPL ENERGY, INC
KAREN AVENUE WIND		WIND	WIND	WIND	WINDPARK	3	NOT COGEN	11.655	1/31/85	SCE	RIVERSIDE	KAREN AVENUE	EUI MANAGEMENT PH, INC.	EUI MANAGEMENT P. H.
GAEL ENERGY L.P.	GAEL ENERGY L.P.	WIND	WIND	WIND	WINDPARK	8	NOT COGEN	8	4/13/90	SCE	RIVERSIDE		WINDSONG ENERGY	GREAT AMERICAN INDUSTRIES, INC
MESA (OWNERS: ZOND-PANAERO I AND		WIND	WIND	WIND	WINDPARK	29.9	NOT COGEN	30	11/29/84	SCE	RIVERSIDE	11001 NORTH WHITE WATER CANYON	MOGUL WIND	MOGUL WIND
PAINTED HILLS WIND DEVELOPERS		WIND	WIND	WIND	WINDPARK	19.265	NOT COGEN	19.265	12/1/85	SCE	RIVERSIDE		PHOENIX ENERGY, LIMITED	PHOENIX ENERGY LTD.
PHOENIX ENERGY LIMITED		WIND	WIND	WIND	WINDPARK	13.51	NOT COGEN	13.51	1/10/85	SCE	RIVERSIDE	79 W INDIAN SEC 22, PALM SPRINGS CA 92262	SEAWEST ENERGY GROUP	RENEWABLE ENERGY VEN
EAST WINDS		WIND	WIND	WIND	WINDPARK	4.165	NOT COGEN	4.165	1/7/85	SCE	RIVERSIDE	79 W INDIAN SEC 22	SEAWEST ENERGY GROUP INC.	SEAWEST ENERGY GROUP
WHITEWATER HILL 3		WIND	WIND	WIND	WINDPARK	3	NOT COGEN	3	3/1/83	SCE	RIVERSIDE		SAN GORGONIO FARMS	SECTION 28 TRUST
SAN JACINTO POWER COMPANY		WIND	WIND	WIND	WINDPARK	4.435	NOT COGEN	18.95	12/1/85	SCE	RIVERSIDE	79 WEST INDIAN	DON DOUTHWRIGHT	ROBERT SMITH
WHITEWATER HILL 28		WIND	WIND	WIND	WINDPARK	28	NOT COGEN	28	4/19/85	SCE	RIVERSIDE			
SECTITON 28 TRUST (SANDBERG III)		WIND	WIND	WIND	WINDPARK	20.756	NOT COGEN	44.446	1/22/85	SCE	RIVERSIDE		SAN GORGONIO FARMS,	SAN GORGONIO FARMS,
EDOM HILL WIND PARK, SO. CALIF. S	A.K.A. PALM SPRINGS WIND PARK	WIND	WIND	WIND	WINDPARK	10.465	NOT COGEN	20	3/15/85	SCE	RIVERSIDE	79 VARNER/EDOM HILL, DESERT HOT SPRINGS CA 92240	SO. CALIFORNIA SUNBELT DEV.	SO.CALIF.SUNBELT DEV

SCAG Region Power Plants

PLANT NAME	ALIAS	FACILITY TYPE	GENERAL FUEL	PRIMARY FUEL	TECHNOLOGY	ONLINE MW	COGEN	GROSS MW	DATE ONLINE	SERVICE AREA	COUNTY	ADDRESS	OPERATOR	OWNER
WINDPOWER PARTNERS 1993, L.P. (TR		WIND	WIND	WIND	WINDPARK	18.237	NOT COGEN	16.2	12/22/86	SCE	RIVERSIDE	18510 KAREN RD	WINTEC, LTD. ADDITION D	WINTEC, LTD.
THE BANK OF NEW YORK TRUST 2		WIND	WIND	WIND	WINDPARK	9.35	NOT COGEN	10	3/2/90	SCE	RIVERSIDE		WIND POWER PARTNERS 1991, L.P.	WIND POWER PARTNERS 1991, L.P.
ZOND CABAZON DEVELOPMENT CORP.	A.K.A. VMSO IV CORPORATION - CABAZON WIND PARK	WIND	WIND	WIND	WINDPARK	40	NOT COGEN	40	12/3/84	SCE	RIVERSIDE	79 VERBENA, CABAZON CA 92230	VMSO IV CORPORATION	VMSO IV CORPORATION
WESTWIND TRUST		WIND	WIND	WIND	WINDPARK	16.207	NOT COGEN	22.5	12/31/85	SCE	RIVERSIDE	CAMERON CANYON RD	WESTWIND ASSOCIATION	WESTWIND ASSOCIATION
WINDPOWER PARTNERS 1993, L.P. (BU		WIND	WIND	WIND	WINDPARK	13.5	NOT COGEN	13.5	12/13/84	SCE	RIVERSIDE	62125 DILLON	RIVERVIEW VENTURES	FRED NOBLE
WINDPOWER PARTNERS 1993, L.P (RIV		WIND	WIND	WIND	WINDPARK	6.2	NOT COGEN	6.2	3/12/87	SCE	RIVERSIDE		S & L RANCH	SIGMUND J. LICHTER
WINDPOWER PARTNERS 1993, L.P. (WH		WIND	WIND	WIND	WINDPARK	5.007	NOT COGEN	6.3	12/27/85	SCE	RIVERSIDE		SAN GORGONIO FARM IN	SAN GORGONIO FARM IN
WINDUSTRIES	F.K.A. WINDINDUSTRIES	WIND	WIND	WIND	WINDPARK	9.8	NOT COGEN	10	11/24/85	SCE	RIVERSIDE	62925 GARNET	WINDUSTRIES, INC.	WINDUSTRIES INC.

Appendix B

SCAG Region Energy Facility Status

CALIFORNIA ENERGY COMMISSION - SCAG REGION ENERGY FACILITY STATUS

6/18/02

Projects Approved Over 300 MW	Status	Capacity (MW)	Construct. Completed (%)	Location	Original On-line Date	Current On-line Date*
Huntington Beach Unit 3 - AES	Construction	225	99	Orange Co.	11/01	7/02
Huntington Beach Unit 4 - AES	Construction	[225]	99	Orange Co.	11/01	on hold
On Line by Summer 02		225				
High Desert - Constellation	Construction	830	54	San Bernardino	7/03	7/03
Blythe - Caithness & FPL	Construction	520	72	Riverside Co.	4/03	3/03
On Line by Summer 03		1,350				
Mountainview - AES	Construction	1,056	15	San Bernardino	6/03	6/04
Op & Const Subtotal		2,631				
Over 300 MW Subtotal		**2,631**				
Projects Approved Under 300 MW						
Wildflower Indigo 1&2 - Intergen	*Operational*	*90*	*100*	*Riverside Co.*	*7/01*	*7/26/01*
Drews - Alliance	*Operational*	*40*	*100*	*San Bernardino*	*9/01*	*8/15/01*
Wildflower Indigo 3 - Intergen	*Operational*	*45*	*100*	*Riverside Co.*	*9/01*	*9/10/01*
Century - Alliance	*Operational*	*40*	*100*	*San Bernardino*	*9/01*	*9/15/01*
On Line by Summer 01		215.0				
Pegasus Energy - Delta Power	*cancelled*	*[181]*	*0*	*San Bernardino Co.*	*cancelled*	*cancelled*
Under 300 MW Subtotal		**215.0**				
Approved Total		**2,846.0**				

Projects in Review Over 300 MW	Process	Capacity (MW)	Project Type	Location	Estimated Decision Date	Estimated On-line Date**
El Segundo Repower 2/ - Dynergy/NRG	12-mo. AFC	630	Replacement	Los Angeles Co.	11/02	11/04
Inland Empire Comb. Cyc. - Calpine	12-mo. AFC	670	Green Field	Riverside Co.	1/03	1/05
Blythe II Comb. Cyc.-Caithness&FPL	6/12-mo. AFC	520	Green Field	Riverside Co.	11/02	5/04
Over 300 MW Subtotal		**1,820**				
Projects in Review Under 300 MW						
City of Vernon Comb. Cyc.	6-mo. AFC	134	Brown Field	Los Angeles Co.	12/02	12/04
Magnolia - SoCal Power Authority	12-mo. AFC	250	Expansion	Los Angeles Co.	12/02	12/04
Under 300 MW Subtotal		**384**				
Review Total		**2,204**				

Projects Announced Over 300 MW	Process	Capacity (MW)	Project Type	Location	Estimated Filing Date	Estimated On-line Date**
Ocotillo Comb. Cycle - Intergen	6/12-mo. AFC	[900]	Green Field	Riverside Co.	unknown	unknown
Teayawa Comb. Cyc. - Calpine	6/12-mo. AFC	600	Green Field	Riverside Co.	unknown	unknown
Over 300 MW Subtotal		**600**				
Projects Announced Under 300 MW						
BP Arco Watson	6/12-mo. AFC	[96]	Expansion	Los Angeles Co.	unknown	unknown
Salton Sea Geothermal - Cal Energy	6-mo. AFC	180	Green Field	Imperial Co.	6/02	9/04
Berry Petrol. Pacerita	6-mo. AFC	[50]	Brown Field	Los Angeles Co.	unknown	unknown
Under 300 MW Subtotal		**180**				
Announced Total		**780**				

Projects Planned Over 300 MW	Process	Capacity (MW)	Project Type	Location	Estimated Filing Date	Estimated On-line Date**
Combined Cycle	12-mo. AFC	[1000]	Replacement	Los Angeles Co.	unknown	unknown
Planned Total		**0**				

Notes:
* Estimated on-line date if construction is not delayed.
** Estimated on-line date if approved and constructed as proposed.
Projects in italics are emergency siting projects.
Megawatts in [ ] are not included in totals.
1/ 1002 MW replaced with 1200 MW for a net increase of 198 MW
2/ 350 MW replaced with 630 MW for a net increase of 280 MW

Greenfield - undeveloped site
Brownfield - developed site
Expansion - New unit at existing power plant site, no loss of existing generation
Repower - Modification of existing equipment
Replacement - Demolition of old plant and construction of new plant

On-line date is expected to be delayed beyond the date shown.
According to developers, the new online date will be determined when the markets are favorable and financing is available.
Approved
In Review
Expected and disclosed
Expected but undisclosed
Cancelled, suspended, withdrawn or on hold
Operational / on-line

Appendix C

State of California Demand Side Programs

State of California Demand Side Programs

4/29/02

Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Residential Sector								
Residential Innovative Peak Demand Reduction Program	Statewide	Lead					Rebates available through summer 02	Incentives to residential customers for peak reducing efforts, including tune-ups of air conditioners, high performance windows, sealed ducts and shade screens. (GF)
Residential Building Standards	Statewide	Lead	Fund IOU Participa-tion, technical support				Effective 6/1/01 New stds adopt in 2003	Applies to all new construction, affects all builders and building departments, provide benefits to all homeowners and renters (ERPA, PGC, DOE, Ratepayers)
Residential Retrofit Standards Study (AB 549)	Statewide	Lead	Possible Funding				Complete 1/1/04	Recommend methods to reduce peak load in existing buildings including mandatory standards (PGC, ERPA)
Residential Appliance Standards	Statewide	Lead	Fund IOU Participa-tion, technical support				adopted 2/6/02, New stds. 2004	Affects manufactures. Benefits all consumers (ERPA, PGC, DOE, Ratepayers)
Federal Funding for Training Production Home Builders	Statewide	Lead					Ongoing	Available to home builders and building departments (ERPA, DOE)
Federal Funding for Building Departments	Statewide	Lead					Ongoing	CEC Hotline, training and support available to all Calif. building departments. (ERPA, DOE)
Residential Solar PV Turnkey Installation	Statewide	Technical support		Lead - Financing			Proposed	Program will modify SMUD-type program statewide, working with multiple partners. Seeks economies of scale to wean buyers off public subsidies. Muni utilities, local government, private parties (CPA)
Emerging Renewable Buydown Program	Statewide	Lead					Ongoing	Provide incentives for the installation of new, onsite, emerging generation technologies (e.g.- PV, small wind). Residential through industrial applications. Approximately $25 million per year. (PGC)
Residential Advanced Interval Meters	Statewide, in selected locations		Establish Rate Structure	Lead - Financing		Muni's to Adopt Time Differen-tiated Tariffs	Loan negotiations pending	Residential pilot of 10,000 meters. Loan contingent on applicant piecing together TOU tariffs, aggregated demand-response, and customer services (CPA)

State of California Demand Side Programs

4/29/02

Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Residential Sector Continued								
Appliance, HVAC, and other efficiency measure rebates	Large and small IOUs		Lead	Financing - Statewide			Ongoing CPA loans to start Q4 '02	Rebates to consumers and incentives for distributors and manufacturers. CPA financing planned for Energy Star appliances. (PGC, GF, CPA)
New Construction and Retrofit Incentives	IOU Service Areas	Technical support	Lead				Ongoing and proposed	Incentives offered for new construction and remodeling improvements that exceed Title 24 requirements. Local third party programs and IOU programs. (PGC)
Distributed Generation Incentives Program	IOU Service Areas		Lead				Ongoing	Provides financial incentives to install DG. Waives certain charges for renewable DG (Ratepayers.)
Net Metering Program	IOU Service Areas		Lead				Ongoing and proposed	Establishes rate and safety rules for selling excess self-generated power back to grid. (Ratepayers)
Time of Use Rate Structure	IOU Service Areas		Lead				Ongoing	Voluntary program that allows customers to take service from IOU at time differentiated rates. (Ratepayers)
Demand Response Pilot programs	SMUD and PG&E	Lead					Design phase, pilots summer 2002	Residential customers on experimental critical peak pricing tariffs in SMUD. A pilot in PG&E area will educate customers to adopt demand responsive and energy efficiency (GF)
Smart Thermostat pilots	SDG&E/SCE	Evaluation support	Lead				Design phase, pilots scheduled for summer 2002	Program design set; IOUs recruiting customers (PGC)
AC Cycling	SCE		Lead				Ongoing.	Residential and commercial customers may participate. Participants receive bill credits in exchange for having their A/C units turned off or cycled on and off up to 6 hours per day. (Ratepayers)

State of California Demand Side Programs

Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Commercial and Industrial Sector								
Demand Responsive Building Systems	Statewide	Lead	Considering Incentives and Programs	Optional Financing			Rebates available for small commercial. CPA loans start Q4 '02	Installation of more demand responsiveness systems and meters for any commercial or industrial customers above 100kW (GF)
Real Time (interval) Meters	Statewide	Lead	Establish Rate Structure	Financing turnkey meter deployment	Technical Support		CEC ongoing installations. CPA approved 1st of 3 loans 4-26-02 for 10,000 meters.	CEC meters for customers over 200 kW (GF); CPUC requires IOU meter recipients to enroll in a Time-of-Use rate schedule. CPA meters for vendors to customers less than 200 kW; financing turnkey meter deployment 10,000 - millions of meters. (CPA)
Nonresidential Building Standards	Statewide	Lead	Fund IOU Participa-tion, technical support				Effective 6/1/01, New stds adopt in 2003	Applies to all new construction and tenant improvements, affects builders and building departments (ERPA, PGC, DOE, Ratepayers)
Nonresidential Appliance Standards	Statewide	Lead	Fund IOU Participa-tion, technical support				Adopted 2/6/02, New stds. 2004	Applies to manufacturers, affects building owners (ERPA, PGC, DOE, Ratepayers)
Nonresidential Retrofit Standards Study (AB 549)	Statewide	Lead	Possible Funding				Complete 1/1/04	Recommend methods to reduce peak load in existing buildings including mandatory standards (PGC, ERPA)
Innovative Peak Demand Reduction Program	Statewide	Lead					Rebates available through summer 02	Incentives to the commercial/industrial customers to reduce demand. Projects include lighting retrofits (GF)
Various Federal Programs	Statewide	Lead					Ongoing Annual Program	Includes: Rebuild America, High Performance School Demonstration Program, and Federal support for Building Standards support efforts. (DOE)
Department of Energy NICE3 Program	Statewide	Lead					Ongoing Annual Program	Serves any industry in Calif. pilot testing an energy saving or environmentally preferred change to their process. (DOE)

State of California Demand Side Programs

4/29/02

Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Commercial and Industrial Sector Continued								
DOE Industries of the Future Program	Statewide	Lead					Ongoing Annual Program	Serves industries selected by Industries of Future Program incl. glass, metal casting, petroleum refining. (DOE)
Tax-Exempt Industrial Development Bonds for Efficiency & Clean Energy	Statewide	Technical Support		Lead - Financing		CDLAC authorized & CIDFAC IDB bond guidance	Launched 4/02	$30 million allocation for 2002, available to small manufacturers with <$10 million near-term capital investment in city/county
Energy Efficiency & Distributed Generation Loans to Business with Repayment via Utility Bills	Statewide	Technical Support	Considering utility bill repayment mechanism	Lead - Financing			Loan repay mechanism proposed 1/02; Loans to start Q4 '02	$200 million loan program planned. Adding utility bill repayment expands market to leased space & debt-constrained organizations under-represented in most State & utility programs. (CPA)
Cool Roofs	Hot areas of state	Lead		Optional Financing			Rebates available through 6/03. CPA loans start Q4 '02	Provide incentives and other measures to lower air conditioning loads (GF, CPA)
Emerging Renewable Buydown Program	Statewide	Lead					Ongoing	Provide incentives for the installation of new, onsite, emerging generation technologies (e.g.- PV, small wind). Residential through industrial applications. Approximately $25 million per year. (PGC)
Incentives for Commercial Lighting	Large and small IOU Service Areas		Lead	Optional Financing - Statewide			PUC 0ngoing. CPA loans start Q4 '02	Retrofit Commercial Buildings with High Efficient Lighting systems by IOUs and third parties. Sierra Pacific and SoCalWater (Bear Valley Electric) Service Territories (Ratepayers, GF, CPA)
Non Residential New Construction and Retrofit	IOU Service Areas		Lead				Ongoing and proposed	Incentives for construction or comprehensive renovations of commercial and industrial buildings. (PGC)
Non Residential Process Overhaul, Motor Change out, HVAC, Lighting	IOU Service Areas		Lead	Optional Financing - Statewide			Ongoing and proposed	Incentives for improving energy efficiency in manufacturing processes, HVAC, variable speed motors, high efficiency lighting. (PGC)

State of California Demand Side Programs

4/29/02

Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Commercial and Industrial Sector Continued								
Traditional Interruptible Programs (TIP)	IOU Service Areas		Lead				Tariffs extended through Dec. 2003.	Participants receive rate discounts in return for specific load amounts to be curtailed during Stage 2 alerts. Participants typically have a monthly demand of at least 500 kW. (Ratepayers)
Base Interruptible Program (BIP)	IOU Service Areas	Deploy Enabling Technologies	Lead				Tariffs extended through Dec. 2003.	Participants receive capacity payments in return for specific load amounts to be curtailed during Stage 2 alerts; participants must be able to curtail 15% of their load, with a minimum load drop of 100 kW per event; A pilot program (San Jose area only) will target smaller customers by increasing the incentives and reducing the minimum load drop to 50 kW per event. (PUC-Ratepayers, CEC-GF)
Demand Bidding Program (DBP)	IOU Service Areas	Deploy Enabling Technologies	Lead		Technical Support		Suspended by DWR until 6/02; CPUC actively considering change in program administration	Participants must bid 10% of their average demand, but not less than 100 kW; participants voluntarily submit energy bids at various price tiers for designated four-hour time blocks of the next day. The price tiers range from 10 cents a kWh to 75 cents a kWh. (PUC-Ratepayers, CEC-GF)
Optional Binding Mandatory Curtailment (OBMC)	IOU Service Areas	Deploy Enabling Technologies	Lead				Tariffs extended through Dec. 2003.	Participants must be able to reduce load on an entire circuit by as much as 15% (in 5% increments). The program is activated only during Stage 3 alerts. A pilot program (PG&E territory only) will allow a variation on how load reductions will be measured. (PUC-Ratepayers, CEC-GF)
Scheduled Load Reduction Program (SLRP)	IOU Service Areas		Lead				Tariffs extended through Dec. 2003.	Participants are paid 10 cents per kWh for reduced load and must reduce their load by 15%, with a minimum load drop of 100 kW per time block. Program operates only during the summer during pre-scheduled time blocks. (Ratepayers)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Commercial and Industrial Sector Continued								
Distributed Generation Incentives Program	IOU Service Areas		Lead				Ongoing	Provides financial incentives to install DG. Waives certain charges for renewable DG (Ratepayers.)
Net Metering Program	IOU Service Areas		Lead				Ongoing and proposed	Establishes rate and safety rules for selling excess self-generated power back to grid. (Ratepayers)
Time of Use Rate Structure	IOU Service Areas		Lead				Ongoing	All >500 kW customers, and > 200 kW customers with GF-funded meters, must pay time differentiated rates. (Ratepayers)
Rolling Blackout Reduction Program (RBRP)	SDG&E Service Territory		Lead				Tariff extended through Dec. 2003.	Participants are paid 20 cents per kWh for reduced load and must have backup generation capable of providing 15% of the customer's annual maximum demand, but not less than 100 kW. Program is operated only during Stage 3 alerts. (SDG&E Ratepayers)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Government Sector								
LED Signals	Statewide	Lead					Fully Subscribed	Replace traffic signals with energy efficient lighting (GF)
Battery Backup for LED Intersections	Statewide	Lead					Available 4/15/02	Battery backup at key intersections with LED signals (GF)
Local Government, Hospitals and School Technical Assistance and Loans	Statewide	Lead		Possible financing			Ongoing for CEC CPA bond proposed Summer '02	Provide Energy Audits, New Construction Design Review and 3% interest loans (4% as of March 02, < $2 mil/project) to local gov't. non-profit hospitals & schools. CPA may float $50 million bond to leverage CEC's expected cash flow (ERPA, ECAA, LJA, possible CPA)
K-12 School Energy Education Program	Statewide					SCSA has lead	All grants awarded	Provide teachers and school districts with resources to improve the energy awareness of school children and their families. (GF)
Retrofit Existing Distributed Generation at Municipal Water Districts	Statewide	Lead					Rebates available through summer 02	Retrofit existing generation units to enable AQMD permitting for longer hours of operation. Municipal & permitted water/wastewater districts may apply. (GF)
Water & Wastewater Treatment Facilities Peak Demand Reduction Program	Statewide	Lead					Rebates available through summer 02	Provide tech. Assistance and rebates for water & wastewater treatment facilities for installation of efficient motors, pumps, energy management control systems, etc. for peak demand reduction (GF, ECAA)
State and University Programs	Statewide	Lead		CPA adding loans starting 2002			CEC funding fully Subscribed	Peak load Reduction planning, staff training and energy efficiency improvements at State Colleges and Universities, 176 state DGS Buildings and all Department of Corrections controlled facilities. (GF, CPA)
CPA Public Agency Loan Pool	Statewide	Technical Support	Considering utility bill repayment mechanism	Lead - Financing			Lending expected Q3 '02	Loans for larger projects > $2 million to tens of millions. Will include efficiency, distributed generation, solar. Initial loans $50 million +. Statewide pool reduces issue & admin costs. (CPA)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Government Sector Continued								
Public School Solar PV Program	Statewide	Technical Lead		Lead - Financing			Proposed Q3 '02	Fund expected to grow as settlements reached. Will be combo of grants and loans. (Attorney General created fund from contract settlements. CPA)
Distributed Generation Technology Public Procurement System	Statewide	Technical Support	Actively considering net metering, interconnection, departing load issues.	Lead		DGS - technical & admin support; CARB technical input.	Ongoing. Procurement Lists expected by Summer '02.	All public agencies across state can use bid and pricing lists. Increases efficiency of state & local purchase decisions on energy technologies. Eligible bidders announced for 2 of 3 technologies. Price competition next. (CPA)
DGS State Energy Projects	Statewide			Financing		DGS Lead	Proposed	These include microcogeneration and energy efficiency projects. CPA adding DG loans starting 2002 (GF, CPA)
Demand Responsive Building Systems	Statewide	Lead	Adopt Incentives and Programs	Optional Financing			Rebates available for small commercial. CPA loans start Q4 '02	Installation of demand responsiveness systems and meters (GF)
Innovative Peak Demand Reduction Program	Statewide	Lead					Rebates available through summer 02	Incentives to local governments to reduce demand. Projects include lighting retrofits (GF)
Cool Roofs	Hot areas of state	Lead		Optional Financing			Rebates available through 6/03. CPA loans start Q4 '02	Provide incentives to and other measures to lower air conditioning loads (GF, CPA)
School Energy Efficiency Measure and Behavioral Education	IOU Service Areas		Lead				Proposed for 2002 and 2003	Various local and IOU service area-wide programs by non-profits and other independent providers. (PGC)
CSU Lighting Program	IOU Service Areas		Lead				Proposed 2002 and 2003	Pilot Voltage Reduction Program (PGC)
Government Energy Efficiency	IOU Service Areas		Lead				Proposed 2002 and 2003	A number of local programs serving various city, county and regional government agencies. (PGC)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Government Sector Continued								
Distributed Generation Incentives Program	IOU Service Areas		Lead				Ongoing	Provides financial incentives to install DG. Waives certain charges for renewable DG (Ratepayers.)
Net Metering Program	IOU Service Areas		Lead				Ongoing and proposed	Establishes rate and safety rules for selling excess self-generated power back to grid. (Ratepayers)
Time of Use Rate Structure	IOU Service Areas		Lead				Ongoing	All >500 kW customers, and > 200 kW customers with GF-funded meters, must pay time differentiated rates. (Ratepayers)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
Agriculture Sector								
Agriculture Loan Program/Technical Assistance	Statewide	Lead					Ongoing Project Management	For agriculture and food processing customers statewide. (PVEA)
Agriculture Peak Load Reduction Program	Statewide	Lead					Funds continue to be available for efficient equipment and pump testing and repair.	Incentives for efficient equipment installed after 1/1/01; Funding for pump testing and repair; Funding to retrofit gas to alternative fuels; Funding for dairy and central facility manure methane power projects. (GF)
Agricultural and Pumping Interruptible Program (AP-I)	SCE Service Territory	Deploy Enabling Technologies	Lead				Tariff extended through Dec. 2003.	Participants are agricultural customers with a demand of 50 kW or greater. Program is designed in a similar fashion to SCE's A/C program. (Ratepayers, GF)
Distributed Generation Incentives Program	IOU Service Areas		Lead				Ongoing	Provides financial incentives to install DG. Waives certain charges for renewable DG (Ratepayers.)
Net Metering Program	IOU Service Areas		Lead				Ongoing and proposed	Establishes rate and safety rules for selling excess self-generated power back to grid. (Ratepayers)
Time of Use Rate Structure	IOU Service Areas		Lead				Ongoing	All >500 kW agriculture customers, and > 200 kW customers with GF-funded meters, with 70% or more of their load dedicated to agricultural purposes, may take service at time differentiated rates. (Ratepayers)

State of California Demand Side Programs

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Program by Sector	Geographic Area Served	Role					Status	Comments
		CEC	CPUC	CPA	DWR	Other		Description & Eligibility (Funding)
All or Multiple Sectors								
Energy Efficiency and Renewable R&D	Statewide	Lead					Ongoing	Research new technologies to reduce peak and improve energy efficiency (PGC)
Public Awareness Initiatives	Statewide	Technical Support	Financial and Technical Support			Dept. of Consumer Affairs Lead	Ongoing through Summer 2002	State-wide media campaign and other public awareness initiatives (GF, PGC)
Education and Outreach	Statewide	Lead					Ongoing	Various presentations, videos, publications etc. to help all consumer classes. (ERPA)
Demand Reserves Sold into Wholesale Ancillary Services Market	Statewide	Technical support and deploy some enabling technologies		Lead	User of resource delivered Tech support and funding		Proposed	Provides up to 1000 MW of verifiable dispatchable "capacity" into the ISO markets to reduce DWR Ancillary service costs. Provides compensation mechanism for users of CEC DR Buildings Systems (CPA)
Measurement, Verification and Evaluation	Statewide						Ongoing	CEC, CPUC and CPA are responsible for evaluating their own programs. CEC participates in CPUC market assessment and evaluation planning process (ERPA, GF, PGC, CPA)
Demand Forecasting and Assessment	Statewide	Lead					Ongoing	Monitor loads and examine consumption and weather patterns to support analysis of temperature relationships, peak demand reduction, energy savings, supply adequacy, program cost effectiveness, and program impacts. Disseminate results. (ERPA, PGC)
20/20 for 2002	IOU Service Areas	Technical Support	Lead		Funding		Under Consideration	The Administration is considering whether to have a similar rebate program this summer.
Education and Outreach	IOU Service Areas		Lead				Ongoing	Various local and IOU service area-wide programs by IOUs and third parties. (PGC)
Municipal Utility District Program	Muni Service Areas	Lead				Muni's PGC	Ongoing through Summer 2002	To conduct programs analogous to the IOU administered programs (GF, PGC)

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Funding Sources Key:	
CPA	California Power Authority bond financing
DOE	U.S. Department of Energy Grants
ECAA	CEC's Energy Conservation Assistance Account
ERPA	CEC's Electricity Resource Procurement Account collected from all ratepayers
GF	General Fund -one time funding
LJA	CEC's Local Jurisdiction Account (PVEA)
PGC	PUC's and Muni's Public Goods Charge collected from ratepayers by utilities
PVEA	Petroleum Violation Escrow Account
Ratepayers	PUC directed funding collected from SCE, PG&E, SDG&E and SoCalGas (energy efficiency programs only) ratepayers

Appendix D

Efficiency Options Assessment

E. EFFICIENCY OPTIONS ASSESSMENT

1. INTRODUCTION

While energy supplies can be obtained in adequate quantities to meet needs projected in the previous sections, options exist to reduce the costs, environmental impacts, and security risks that projected use will entail."[12] This section outlines a range of resource efficiency options under four broad categories of local/regional decision-making. From this large set, a screening process is used to select a set of efficiency opportunities for detailed evaluation described in subsequent sections.

Table 12-8: Summary of Petroleum Combustion Emissions (average tons per day)

	Nox			ROG			Sox		
	1990	2000	2010	1990	2000	2010	1990	2000	2010
Gasoline									
Automobiles	319	172	104	430	237	121	16	12	12
Light/Med Trucks	143	117	105	142	87	51	7	7	7
Heavy Trucks	15	6	3	6	2	1	1	0	0
Motorcycles	2	2	3	7	7	9	0	0	0
Subtotal	479	297	215	585	333	182	24	19	19
Light Distillates									
Automobiles	6	1	1	1	0	0	1	0	0
Light/Med Trucks	1	0	0	1	0	0	0	0	0
Heavy Trucks	207	191	226	30	32	40	11	8	9
Transit Buses	10	10	11	2	2	2	0	0	0
Aviation	16	19	21	18	17	18	1	1	1
Commerce	39	41	42	1	2	2	31	31	32
Industry	18	20	21	1	1	1	5	5	5
Powerplants	6	1	6	0	0	1	2	2	9
Subtotal	303	284	328	55	54	63	51	47	56
Heavy Distillates									
Ships	34	37	37	1	1	1	34	36	37
Industry	0	0	0	0	0	0	0	0	0
Powerplants	0	0	0	0	0	0	0	0	0
Subtotal	34	37	37	1	1	1	34	36	37
Total Emissions	816	618	580	641	388	246	109	102	112

Source: Ship and aviation from SCAQMD, 1991 AQMP, Tech Report V-C. Commercial and industrial emissions from CEC spreadsheet models. Mobile source emissions from CEC energy use projections processed through CARB EMFAC/Burden models.

[12] Based upon its comprehensive biennial assessments of energy supply and demand, the CEC anticipates that the state will not face absolute or chronic shortages. The potential for short-term shortages of all fuels, due to physical emergencies (such as earthquakes) always remains. However, the State and local government have well-developed contingency planning process to mitigate impacts. Petroleum dependence in the transportation sector, however, does present significant price risks.

2. COMPREHENSIVE EFFICIENCY OPTIONS

Energy efficiency options span a variety of technical and policy measures. Rather than being exhaustive, this chapter illustrates an evaluation of the integrated consequences stemming from introduction of a comprehensive set of potential measures. The concept shows that measures generally considered to be derived from energy policy have consequences in a far broader set of forums. Again, recognition of the interconnections among segregated policy processes is a central goal of the chapter.

As noted previously, the energy efficiency options were considered under four broad categories, described below. While these categories are not mutually exclusive, they historically have been examined in different forums by different policy-makers, frequently in different agencies with focused or single purpose missions.

a. Buildings and Appliances

A large number of technical measures exist to improve the energy efficiency and the environmental consequences of using energy for buildings and appliances that serve human needs. California has been a pioneer in developing energy efficiency regulations, utility retrofit programs, and public assistance programs to improve the energy efficiency of buildings and appliances within the state. As a result, the state now consumes about 15 percent less electric energy per unit of economic activity than it did in 1975, when this effort began. Additional efficiencies are expected and are embodied within the long term baseline demand forecasts.

b. Land-Use

Land-use efficiency opportunities relate primarily to the development of land to support residential, commercial, and industrial growth. These opportunities occur in a wide range of scales, from development of new cities to individual development projects. Measures classified here may have considerable consequences for building energy demand, community infrastructure, and transportation. For example, higher-density attached housing generally is more energy efficient than detached single-family homes because of common sidewalls, which reduce the consumption of electricity and natural gas used for space conditioning. Also, by placing residents closer together, transit options become more feasible and transit use increases as routes can be closer to greater numbers of people. Guiding development to take advantage of existing transmission and distribution facilities and infill opportunities, providing opportunities for people to work near their residences in order to reduce commuting by automobiles, and incorporating other site design options have a variety of energy-demand and infrastructure consequences.

c. Movement of People, Material, and Information

Transportation options address four broad groups of measures: (1) increased efficiencies in the energy and infrastructure required to continue use of personal automobiles, (2) mode shifts to transit as a substitute for the personal car, (3) other transportation demand management options to reduce travel altogether, and (4) system management measures to improve capacity use.

d. Infrastructure

Infrastructure, as analyzed in this category, includes water supply, waste-water disposal, and solid waste disposal.[13] Efficiency options included in this category consist of water conservation, improved efficiency in pumping, and waste recycling programs that reduce the amount of waste in the disposal system.

[13] One measure crossing building design and infrastructure is the opportunity for grey water recycling. Successfully implemented by the City of Anaheim, this option is a good example of the need for integrated design and planning.

3. COMPREHENSIVE EFFICIENCY OPTIONS

a. Screening Options

Among the large numbers of potential energy efficiency options that could be assessed, a manageable number of key options were identified through a two-stage screening process. In Stage One of this process, a long list of options was constructed within each of the four categories, constrained only by judgments that potential energy, environmental, or infrastructure impacts could be significant when implemented. In Stage Two, a more intensive, semi-quantitative screening process was used that examined each option for nine criteria:

- Ability to quantify impacts
- Energy reduction potential
- Rate of energy reduction
- Cost effectiveness
- Environmental impacts
- Technical feasibility
- Enforceability
- Energy security impacts
- Equity impacts

The purpose of these criteria is to identify measures with larger impacts, or ones with greater net benefits, from multiple-decision perspectives. Throughout the process, the goals included ensuring that energy service needs were met as economically and efficiently as possible; thus absolute "conservation," i.e., "doing without," was not an intention. The ability to be enacted by regional or local government, or at least supported in state or federal forums, was examined later in the process.

During Stage One, the list was narrowed to 55 intermediate options. These 55 options were then subjected in Stage Two to an evaluation using the nine criteria listed above. The results are shown in Table 12-9.

Table 12 – 9: Intermediate Options

OPTION	Score	Relative Rank
Buildings and Appliances:		
Standards and Regulations		
Title 24 Enforcement	93	5
Supplemental Building Measures	103	1
Existing Building Energy Efficiency Ordinance	97	4
Solar Access Ordinance	83	11
Local Appliance Standard	93	5
Incentive Programs		
Collaborative Process Participation	85	10
Expedite Permits	83	11
Design Assistance		
Design Assistance for Government Buildings	89	8
Design Assistance for Private Buildings	93	5
Neighborhood Energy System	89	8
Public Information and Labeling		
Promote Efficient Behavior	103	1
Home Energy Rating System	99	3
SCAG Design Competition	83	11

OPTIONS CONT.	Score	Relative Rank
Land Use:		
Regional Scale		
Network of Compact Large Cities	87	8
Network of Compact Small Cities	87	8
Subregional Jobs/Housing Balance	75	10
Regional Urban Expansion Limit Lines	71	11
Regional-scale Telecommuting & Teleconferencing	87	8
City Scale		
Compact and Contiguous Development Pattern	83	9
Large Mixed-Use Centers	95	5
City-wide Jobs/Housing Balance	93	6
Sub-City Scale		
Mixed Residences & Work sites	103	1
Dispersed Shops & Services	101	2
Concentrated Shops & Services	103	1
Housing and Jobs Near Transit	93	6
Services Near Transit	97	4
Compact Housing	93	6
Energy Efficient Street Design	83	9
Project Scale		
Energy Efficient Landscaping and Site Design	91	7
Mixed Residences, Shops & Services, & Work sites	103	1
Reduce Auto Parking & Improve Pedestrian, Bike, and Transit Access	99	3
Movement of People, Material, and Information:		
Improvements in Vehicles or Fuels		
Vehicle Technology	104	3
Alternative Fuel Incentives	101	4
Reducing VMT		
Rideshare Programs	107	2
Transit (Bus/Rail)	93	6
Park & Ride/Shuttle Systems	90	7
Telecommuting	96	5
High Occupancy Vehicle (HOV) Bus Lanes	87	8
Parking/Congestion Pricing	90	7
Bicycle/Pedestrian Improvements	112	1
Infrastructure		
Water		
Reduce Consumption of Water	109	1
Use More Efficient Technology	89	8
Reduce Length of Lines	87	9
Waste Water		
Reduce Consumption of Water	101	5
Use More Efficient Technology	89	8
Reduce Length of Lines	87	9
Solid Waste		
Increased Composting	103	3
Zoning for Recycling	89	8
Improve Efficiency of the Recycling Process	105	2
Variable Rates for Garbage Collection		
Improve Efficiency of the Garbage and Collection Processing	103	4
Waste to Energy	97	6
Consumer Source Reduction	79	10
More Durable Consumer Products	91	7
Reuse of Commercial and Industrial Material	97	6
Reuse of Household Items	97	6

b. Selecting Efficiency Opportunities

In Stage Three of the screening process, five high-ranking options in Buildings and Appliances and four in Infrastructure, as described below, were selected for further analysis. All of the options in Movement of People, Material, and Information were selected for further analysis, although several were combined and refined. Many of the measures in Land Use were combined and incorporated with increased transit-this was done because of the close interconnection between land use and transportation, and because of the methodological difficulties and lack of data to measure the energy impacts, on a regional scale, of subtle local differences in land use. The options under Land Use and the Movement of People, Material, and Information were then combined into one category, Land-use and Mobility, to reflect this close interrelationship. The outcome of Stage 3 was the selection of 18 options for detailed analysis; these are summarized in the following sections.

Buildings and Appliances:

A. Supplemental Building Measures.[14] Implement building efficiency measures that supplement Title 24 and respond to the unique conditions of southern California. These measures could include HVAC duct testing, solar pool heating (where cost effective), day-lighting, and building commissioning (verifying that the HVAC and lighting systems in new buildings are operating properly).
B. Public Awareness Campaigns. Promote energy efficient behavior through public awareness campaigns. The types of behavior that would be promoted include using efficient lighting and refrigerators, maintaining residential HVAC systems, behavioral changes such as turning off lights when not needed, using solar water heating, and using energy efficient office equipment.[15]
C. Home Energy Rating System. Implement home energy rating systems and associated energy efficiency mortgage program. The rating system would involve a short inspection of the house, a computer-generated rating based on the inspection, and a set of recommendations for improving efficiency.
D. Existing Building (Retrofit) Ordinance. Address existing building stock through energy conservation ordinances that apply at the time a building is sold or leased. These ordinances could address such issues as ceiling insulation, pipe and duct insulation, water heater jackets, and low-flow devices.
E. Enhanced Title 24 Enforcement. Increase compliance with existing Title 24 building standards through training, incentives, and inspection programs.

Land Use and Mobility:

F. Vehicle Efficiency Standards. Adopt state standards, through the DRIVE+ process,[16] that call for increased vehicle efficiencies. These standards, which deal with fleet fuel efficiency, are already included in federal and state statutes. (As originally written, this measure emphasized specific penetrations of individual fuels. In fact, the market in concert with incentives and existing mandates will determine specific future alternative fuel penetrations.)
G. Alternative Fuels Incentives. Implement one or more of a wide range of incentives for using alternative fuels such as natural gas vehicles, oxygenated gasoline, flexible fuel vehicles, alternate fuel vehicles, and electric vehicles.
H. Increased Vehicle Occupancy. Implement ride sharing, park and ride, and high-occupancy vehicle (HOV) and bus lanes. The intent is to increase the average vehicle occupancy from the current level of about 1.2 persons per vehicle.

[14] Due to comments from the Southern California Building Industry Association, this measure has been revised to provide savings from voluntary efforts rather than standards.
[15] As identified later, public awareness campaigns are important across all sectors, particularly regarding techniques such as VMT reduction, transit use and recycling.
[16] Drive+ stands for Demand-based Reductions in Vehicle Emissions Plus Improvements in Fuel Economy; the program uses sales taxes as incentives or disincentives.

I. Telecommuting. Promote telecommuting programs that reduce the number of trips per day per employee, with potential net reductions in congestion and air emissions. These programs include measures to encourage people to work at local telecommuting centers or at home.
J. Pedestrian and Bicycle Emphasis. Provide pedestrian and bicycle facilities within a pattern of compact, mixed-use, transit-oriented development. The intent is to replace automobile trips that are five miles or less.
K. Transit and Land-Use Emphasis. Provide increased transit facilities within a pattern of compact, mixed-use, transit-oriented development. The transit modes include bus, light rail, commuter rail, and scheduled shuttle service. The more compact land-use patterns will also produce savings in embodied energy and energy used for operations of the buildings.
L. Congestion Pricing. Charge more for automobile travel that takes place at times of high congestion as a way of distributing travel over time and encouraging transit use. This is typically implemented through toll facilities on major commuter corridors, either during peak commute periods or 24 hours per day.
M. Parking Pricing. Charge more for parking in congested destinations as a way to reflect the true cost of providing parking.
N. Energy-Efficient Landscaping and Site Design. Encourage water-conserving landscaping, site buildings to take advantage of prevailing winds, and use landscaping for shading. This measure can also produce water savings.

Infrastructure:
O. Reduction of Water Consumption. Reduce water consumption to decrease the energy needed for water and waste-water pumping and treatment. In addition to reducing fresh water and its associated energy demand, this measure also reduces the amount of waste water that must be collected, pumped, and treated.
P. Increased Composting. Increase composting as a means to reduce energy needed to transport and process solid waste. This approach is very efficient because backyard composting requires virtually no energy.
This measure also reduces the need for landfill.
O. Improved Efficiency of the Recycling Process. Increase the efficiency of the processes used to collect and process recycled material. The improvements that could be made include co-collection of trash and recyclables, using energy-efficient vehicles, and using efficient routes.
R. Variable Rates for Garbage Collection. Implement a variable rate system that would encourage reductions in waste generation and encourage composting. The intent is to have a relatively low rate for a level of basic service with an escalating rate for additional garbage cans or bags.

F. EFFICIENCY OPTIONS ASSESSMENT

1. EVALUATION METHODOLOGY

The 18 opportunities identified through the screening process were evaluated for energy, air quality, and infrastructure impacts. To accomplish this, a significant effort was invested to develop quantitative descriptions of the efficiency opportunities. Additionally, estimates of penetration of measures were required along with quantification of consequent impacts upon specific economic sectors used in the baseline forecast. A series of forecasting and impact projection models developed at the CEC or adapted from the work of others were used to complete the latter task. The quantitative description of options is found in the Regional Energy Report. In fact, one primary objective in the energy analysis was to develop and describe analytic steps and modeling tools necessary for a thorough evaluation of efficiency options from an integrated perspective. Documentation of the analysis is provided in the appendix to the Regional Energy Report.

Results of the evaluation are presented for 2010 in Tables 12-10 through 12-12.[17] Overall agenda implementation could result in a savings in 2010 of over 7,000 GWh of electricity and 330 million therms of natural gas. These savings are equivalent to approximately 270,000 billion BTUs saved, with resulting Nox and ROG reduction totaling more than 17,000 and 13,000 tons per year, respectively. Additional water and waste disposal savings could occur by the year 2010 as indicated in Tables 12-11 and 12-12.

It is important to read the notes immediately following Table 12-10 to interpret the table accurately. Also, it is important to note that the results are illustrative-different outcomes would occur with changes in the modeling assumptions and characterization of measures.

Measure F. Vehicle Efficiency Standards, shows the highest energy savings and also provides the highest benefits in emissions improvements for NOx, SO_X, and ROG. (Over one-third of the NOx reductions from the opportunities evaluated occur due to this measure.)

Measure B. Public Awareness Campaigns, also achieves high energy savings, 47,000 BTUs. The reason is that it is actually a collection of a number of concepts under a common strategy, the measure potentially affects a percentage of all new and existing buildings, and the measure assumes some significant changes in human behavior.

Measure K. Transit and Land-Use indicates potential for major energy savings; this is a result of both a shift from automobiles to transit and an energy savings due to increased densities and efficient site designs. This measure will have an increasing relative impact after 2010 because changes in land-use patterns occur over longer periods of time than more direct energy measures.

[17] The Regional Energy Report provides detailed results for 2000 and 2005. These results show that some measures have greater near-term impacts and would appear to be more effective if rapid change was desirable.

Table 12-10: Energy Savings and Displaced Emissions: 2010

Measure		Electricity GWh	Natural Gas Million Therms	Transportation Fuel Consumption (Million Gallons of Gasoline Equivalents) Gasoline	Diesel	CNG	Methanol	BTU Billions	NOx Tons	SOx Tons	ROG Tons
A	Supplemental Building Measures	70	9					1,508	30	1	1
B	Public Awareness Campaigns	3,298	161					47,122	665	16	13
C	Home Energy Rating System	71	6					1,234	21	0	0
D	Existing Building Ordinance	743	29					9,857	129	3	3
E	Title 24 Enforcement	80	4					1,152	16	0	0
F	Vehicle Efficiency Standards	0		516		18	50	73,000	6,670	723	7,033
G	Alternate Fuels Incentives	(1,098)		857		(102)	(674)	(192)	899	(71)	(1,011)
H	Increase Vehicle Occupancy	0		135		8	35	22,250	2,183	223	2,096
I	Telecommuting	0		53		3	14	8,750	868	89	834
J	Pedestrian and Bicycle Emphasis	0		19		1	5	3,125	306	31	294
K	Transit and Land-Use Emphasis	933	128	125		8	32	42,227	1,905	179	1,921
L/M	Road & Parking Pricing	220		146		10	37	26,188	2,364	241	2,260
N	Landscaping and Site Design	380						3,570	19	1	0
O	Reduce Water	2,740						25,742	137	8	0
P	Increase Composting				6			895	479	20	85
Q	Improve Efficiency of Recycling				4			559	299	12	53
R	Variable Rates for Garbage Collection				3			447	239	10	42
	TOTALS	7,435	337	1,851	14	(54)	(501)	267,434	17,229	1,486	13,625

Note: To accurately interpret this table, see notes on the following page.

Notes to accompany Table 12-10:

1. The energy savings as expressed in the columns are for the year indicated in the title line of the table and assume that the implementation of the various measures begins in 1995.
2. CNG (compressed natural gas) and methanol are expressed in millions of equivalent gallons of gasoline.
3. Electricity is converted to BTUs using a relationship of 9,395 BTU per kWh to account for generation losses.
4. Natural gas is converted to BTUs using a relationship of 0.1 million BTU per therm.
5. Gasoline is converted to BTUs using a relationship of 125,000 BTU per gallon of gasoline.
6. Diesel is converted to BTUs using a relationship of 5.8 million BTU per barrel (42 gallons) of Diesel fuel.
7. CNG and methanol are converted to BTUs in the same manner as gasoline because they are expressed in equivalent gallons of gasoline.
8. The analysis of Measures F through M is interconnected:
   - Measure G assumes that Measure F is in place.
   - Measures H through M assume that Measures F and G have been implemented; the numbers in the columns for Measures H through M represent the savings after F and G are in place.
   - Measures L and M are the additional savings if pricing mechanisms are implemented along with Measures H through K.

Measure L/M, Road/Parking Pricing, and Measure H, Increased Vehicle Occupancy, rank high in energy savings and NOx reductions, each with over 20,000 BTUs and 2,000 ton reductions respectively. These can clearly be important components of a broad strategy designed to address mobile sector emissions and energy consumption.

In the infrastructure arena, the measure indicating greatest potential is Measure O, Reduction of Water Consumption, which, due to reduced pumping and treatment requirements, can save over 25 trillion BTUs. While all infrastructure measures reviewed have energy and air benefits, cost considerations and the potentially limited availability of new water supplies and land-disposal facilities add importance to these measures.

Table 12-11: Projected Reduction of Water Consumption (acre-feet)

	2000	2005	2010
Measure N			
Landscaping	13,043	15,989	18,157
Shading	(40,521)	(49,675)	(56,411)
Net Result	(27,478)	(3,686)	(38,253)
Measure O	461,186	599,163	737,100

Measure P, Increased Composting, reduces the need for additional landfill.[18] Measure R, Variable Rates for Garbage Collection, may result in a reduction of packing and other materials over the long term. Measures P, Q, and R together are assumed to divert significant amounts of solid waste as part of the AB 939 implementation *(see* Table 12-12).

Table 12-12: Projected Diversion of Solid Waste (tons)

	2000	2005	2010
Measure P	2,793,054	3,013,975	3,238,942
Measure Q	6,982,634	7,534,938	8,097,355
Measure R	1,396,527	1,506,988	1,619,471

[18] Unless available control measures are utilized, this measure can increase emissions.

Several measures also produce benefits that are not reflected in Table 12-10. Measure O, Reduction of Water Consumption, results in less water being used *(see* Table 12-11). The water-conserving landscaping component of Measure N reduces water consumption; however, this savings could be offset by the additional water required for shade trees, if this component of the measure is implemented.

In Summary

The results provided in Tables 12-10 through 12-12 illustrate the impacts of each measure, should it be implemented as described throughout the SCAG region. These impacts are not cumulative, since some interactions among measures have not been eliminated. Of course, the total impacts of all these illustrative measures could only be accomplished through concerted efforts by many jurisdictions-local, regional, state, and federal-working toward a common end.

The purpose of this chapter is not to advocate one measure over another. All 18 measures are worthy of at least an initial look to see if they are appropriate in a given circumstance. Discussion of implementation options for all 18 measures are included in the final section of this chapter.

Of particular importance in choosing implementation strategies is observation of those which have multiple benefits. Composting, for example, can reduce landfill and energy system requirements. At the same time, without proper emission control techniques, local air quality impacts could occur. DSM, if implemented successfully through local state or federal programs (for buildings or transportation) should achieve positive energy, air and congestion outcomes.

The highest-ranking measures should not be considered the winners to the detriment of other lower-ranking measures. The SCAG region is very large and diverse-what works in one area may not be appropriate in another. Also, the cost and ease of implementation may vary widely among the various measures and should be a major factor in selecting a package of strategies for the region, a subregion, or local government.

A combined energy and air emissions analysis reveals that the transportation measures achieve the largest air quality benefits. Higher fuel economy or shifts toward alternate fuels do not, however, contribute to the reduction or even mitigation of transportation congestion. This suggests that the most effective air quality measures may be low on the scale of mobility planning. Major shifts toward alternate energy forms for transportation also raise a series of fuel supply and distribution issues that require additional examination. Close coordination between these perspectives is needed to achieve a balanced solution to the region's problems.

What is most revealing are the powerful impacts of appealing successfully to energy consumers through public awareness campaigns. These measures can influence building energy conservation, occupancy of vehicles for commuting, or selection of transit or other VMT reducing efforts. The large benefits and the relatively low costs of the effort suggest this measure should be explored by all jurisdictions.

The RCPG process illustrates how difficult it is to analytically assess measures cutting across many jurisdictions, let alone achieve the impacts required through collective action. While many jurisdictions cannot individually pursue some of these measures, the presumption of regional implementation used for analytical purposes illustrates how important collective action can be as compared to individual action. Greater benefits can frequently be achieved, and probably at lower costs, to a group of jurisdictions working together on a common measure rather than through individual actions. Individual jurisdictions, however, can implement some of these measures in the area of their responsibility and achieve some portion of these impacts should they desire to do so. Implementation of individual measures in the agenda is discussed in detail in the Regional Energy Report and summarized in Section G of this chapter.

G. EFFICIENCY OPPORTUNITY AGENDA: IMPLEMENTATION

The implementation strategies for the 18 measures vary considerably because the measures themselves are so diverse. Some depend upon voluntary changes in public behavior, while others can be mandated by local governments. SCAG can play a major role in providing for an exchange of information among its members and developing joint programs with energy utilities, other public agencies, and private businesses. Detailed review of cost-effectiveness of specific programs and measures, beyond the scope of this study, is essential prior to implementation by individual jurisdictions.

1. INDIVIDUAL MEASURES

The following is a brief summary of implementation strategies:

Measure A--Supplemental Building Measures. This measure is designed to provide energy savings through implementation of measures supplemental to those required by existing state and federal standards. Examples of potential measures are HVAC duct testing, solar pool heating (if cost effective), day lighting, building orientation, passive solar application, commercial building climate control measure, and building commissioning. Savings can be achieved through a variety of mechanisms, including utility incentive programs proven cost effective to rate payers and the South Coast Air Quality Management District's measure allowing RECLAIM trading credits to be obtained from area source efficiency improvements. This measure could accompanied by the following: a technical assistance program; energy and water use evaluation requirements for large-scale developments; incentives for extra-efficient projects; and a monitoring and evaluation element to track the effectiveness of a variety of supplemental measures.

Measure B-Public Awareness Campaigns. As the Energy Commission's July 1993 *Energy Efficiency Report* makes clear, the single greatest impediment to a more energy-efficient energy-reducing society, from our high-rises to our highways, from our daily activities to our dreams for the future, is the public reluctance to make energy-wise decisions. Carefully coordinated public awareness campaigns could be implemented by energy utilities, local governments, regional agencies, and state agencies. Basic information is most efficiently developed at a state or regional level, with campaigns conducted at a more local level. Programs to educate and inform the public can be introduced and distributed through a number of channels, including schools, community centers and gathering places, cable television stations, newspapers, and direct mailings.

Measure C -Home Energy Rating System. The California Home Energy Efficiency Rating System (CHEERS), Inc. has been formed to promote the use of a uniform, statewide home energy rating system. CHEERS is a public-private partnership that includes lenders, real estate agents, HVAC and insulation contractors, utilities, public interest groups, and government. Energy utilities have been successful in implementing this type of program, and this approach could be continued. State and regional agencies, such as the CEC and SCAG, as well as local governments, could assist energy utilities by providing opportunities to help make people aware of the program and its benefits. As currently implemented, this measure goes hand-in-hand with mortgage lending programs.

Measure D-Existing Building (Retrofit) Ordinance. Implementation of existing building retrofit ordinances occurs primarily at the local level, and usually at the time a building is sold or leased. This measure would be implemented primarily by cities and counties with the adoption of an energy retrofit ordinance. Local control is important because a retrofit ordinance must reflect the fabric of a community and not lead to the destruction of historic and other significant buildings. Since retrofit ordinances would be adopted mostly by local governments, regional agencies could provide an important role as sources of information. Regional agencies could undertake a survey of local retrofit ordinances and could develop model ordinances for consideration by cities and counties. Supplementing such ordinances could be education and incentive programs; a mandatory audit ordinance; and special provisions for buildings in redevelopment areas.

Measure E-Enhanced Title 24 Enforcement. Enhance the enforcement of existing energy efficiency standards contained in Title 24 of the California Code of Regulations for residential and nonresidential buildings. This can be accomplished by encouraging local government building departments to require full enforcements of the standards prior to authorizing occupancy of any newly constructed building. Building departments can use existing programs to improve their enforcement knowledge and techniques. Such programs include on-going training opportunities, certified energy plan examiners, and "red tagging" inadequately installed measures. Additional implementation opportunities include provision of state incentives for high-cooperation builders and awards for successful local programs.

Measure F-Vehicle Efficiency Standards. This measure is implemented at the federal and state level in accordance with legislative mandates from laws such as the federal Clean Air Act and the California Clean Air Act. No action need be taken by SCAG, other regional agencies, or local governments at this time.

Measure G-Alternative Fuels Incentives. Implementing the development of alternative fuels-including electric, natural gas, and others-to reduce reliance on imported gasoline will be undertaken primarily at state and federal levels, in coordination with the oil and gas industries. Low emission vehicle standards have already been adopted by the state. Local governments can assist primarily by purchasing these vehicles as an example to their residents, as well as through hosting demonstrations and test-rides of the vehicles. Regional agencies and energy utilities can do the same, plus undertake public awareness campaigns to encourage use of low emission-vehicles. Utilities are presently seeking authorization from the CPUC to expand LEV programs, including incentives to purchasers. SCAQMD is relying upon natural gas vehicles and alternative fuels as part of its air quality attainment strategy, but emphasizes electric vehicles over others.

Measure H-Increased Vehicle Occupancy. All levels of government can contribute to the implementation of this measure. Local governments can encourage carpool and vanpool programs and adopt trip reduction ordinances. While many of the needed programs are in place, a local jurisdiction can enhance effectiveness by helping fund information and promotion campaigns, and construct preferential parking, among other items. Regional and state transportation agencies can provide for HOV lanes between communities. All levels of government can conduct public awareness campaigns to encourage increased vehicle occupancy.

Measure I-Telecommuting. Local governments can encourage telecommuting by adopting such programs for their employees, allowing or encouraging local telecommuting centers through their general plan and land-use regulations, and allowing or encouraging people to work at home through their home occupations ordinances. The viability of telecommuting, however, is largely beyond the control of local jurisdictions, although telecommuting centers can be programmed into future developments or retro-fitted into existing areas through zoning requirements. State and regional agencies can help implement telecommuting through information campaigns and by providing opportunities for their employees to telecommute. More specific implementation ideas include the.provision of credits to employers subject to telecommuting provisions of a trip reduction ordinance and the organization of forums and workshops for local employers to explain the benefits of telecommuting.

Measure J-Pedestrian and Bicycle Emphasis. This would be implemented primarily by cities and counties through their general plans, specific plans, design guidelines, and land-use ordinances. The local governments could require an integrated system of pedestrian and bicycle paths, bike storage facilities, and shower facilities. More compact land use patterns, especially involving mixed uses, would also assist in this measure. Although local governments assume primary power to implement this measure, regional agencies, especially those responsible for transportation and air quality, could encourage local governments to adopt programs which support bicycle ridership and pedestrianism. Regional agencies also could coordinate the efforts of cities and counties to assure a regional system. To assist in the implementation of the measure, the following strategies could be considered: appointment of a bicycle/pedestrian coordinator or advocate, amendment of subdivision ordinances to

require pathways and/or a system of paths, development and distribution of maps which clearly illustrate bicycle and pedestrian systems, and establishment of education programs.

Measure K-Transit and Land-Use Emphasis. This measure deals with the potential for energy savings from increased transit facilities within a pattern of compact, mixed use, transit-oriented development. This measure should be implemented by a range of public agencies. The transit system must start with a regional framework of linkages between major communities, residential centers, and employment centers. To be most effective, this must be accompanied by local government programs that encourage growth around transit stops and stations, provide easy access to the stops and stations, provide for convenience services at transit stations, and provide for local feeder bus service. Related implementation strategies include coordination with transit agencies to pursue joint development projects, including housing, adjacent to transit stations; provision of zoning incentives, including density bonuses; and adoption of specific plans around rail stations and transit centers.

Measure L-Congestion Pricing. This measure can best be implemented at the geographical level which is effective. Tolls will produce side effects that must be understood by all agencies in advance of their imposition. The tolls can be imposed by the state or by operators of private road or bridges. While limited opportunity exists for direct implementation of congestion pricing by local governments, agencies can work to facilitate implementation if desired.

Measure M-Parking Pricing. This measure could be implemented on' a regional or local level. The advantage of regional implementation is that the impacts upon business could be spread more evenly throughout the region. A local government could implement a parking pricing program to relieve congestion in certain areas or to encourage use of transit. The easiest method for local jurisdictions to implement parking pricing is to manipulate peak-hour rates at publicly-controlled parking facilities. Parking rates at private facilities are set based on competition: one indirect method of raising rates is to limit or otherwise control the number of private parking facilities in an employment area through zoning or design requirements. Finally, a city may choose to (a) lower parking requirements and set maximums for employers, allowing the value of the displaced parking to be used to subsidize transit, vanpools, or other modes, (b) seek a cooperative agreement with parking operators where rates are set artificially high and the excess profits used for transit, or (c) institute a tax on private parking facilities that can be used to subsidize alternative modes.

Measure N Energy-Efficient Landscaping and Site Design. This measure would encourage water-conserving landscaping, site buildings to take advantage of prevailing winds, and use landscaping for shading. Homeowners planting a new yard, businesses creating facility amenities, and cities with their street trees spend money on landscaping; the issue is to get them to use those funds to conserve energy. To that end, regional and local agencies and governments should develop guidelines or manuals for water- and energy-conserving landscaping in their communities. Additional implementation strategies related to this measure include a strong enforcement system, installation of efficient landscapes at government facilities, community-based awards program for energy-efficient landscaping and site design, and regular workshops and information sessions to educate the public about this measure.

Measure O--Reduction of Water Consumption. This measure aims at reducing water consumption to decrease the energy needed for water and waste-water pumping and treatment. It can be implemented by public awareness campaigns at all levels of government and by energy utilities. Basic information can be prepared at a state or regional level, energy utilities can disseminate information, and local governments can make information available. Local governments could work in collaboration with schools and other community-based centers to disseminate information as a way to implement this measure.

Measure P-Increased Composting. The basic structure to reduce solid waste is in place with the passage of AB 939. All levels of government can undertake public awareness campaigns on the ease and benefits of composting. As with other types of public awareness programs, the most efficient approach is to have material prepared at a state or regional level and' then have local

agencies customize it as necessary and disseminate it to local residents. Local agencies and governments can utilize a wide-range of channels to educate residents about composting. This outreach could include pamphlets, "How To" manuals, and live or televised demonstrations. Local entities can ensure that composing bins are available to local residents. Local governments should examine their general plan, zoning ordinance, and design guidelines to ensure that composting is not inadvertently discouraged.

Measure Q-Improved Efficiency of Recycling Process. This measure would be directly implemented by those entities, public or private, responsible for the collection of recycled materials. Regional agencies, such as SCAG, could assist in determining appropriate regional-level sites for collection and distribution centers, and processing facilities. Additionally, regional agencies could disseminate information to the public about recycling and ways to participate in the recycling process. Local governments would, at a minimum, need to be active partners in encouraging transfer stations and educating their residents about the program benefits.

Measure R-Variable Rates for Garbage Collection. This measure would be implemented by those entities that are responsible for setting garbage collection rates. Other entities could add support through providing information illustrating the benefits of variable rates. Most, if not all, local governments have control over garbage rates; therefore, they have the ability to adopt variable rates for their jurisdictions. Cities and counties should have policies in their general plans that call for variable rates in order to achieve land use and environmental goals. The variable rates would be adopted through whatever process is currently used to set rates.

2. FINANCING

Implementing energy efficiency projects is a challenge because they often require capital investments in order to realize energy and cost savings. Projects may be cost-effective, but unless a funding mechanism is available, they may not be implemented. In many cases, the financial resources and implementation strategies exist to improve energy efficiency and conservation in southern California. Since most of the 17 measures described will be effective only with public and business cooperation, and in many cases require little financial outlay by local governments, the guiding watchwords for the most productive funding options are "Education," "Partnership," and "Community Initiative."
A number of funding mechanisms for these 17 energy measures are available through federal, state, and local sources. These different financing options have been summarized in "'Energy Improvements Financing Alternatives Study" (KPMG Peat Marwick, December 1992), "San Diego Regional Energy Plan Financing Options" (Scripps Consulting Group, May 1993), and "Financing Strategies for Integrated Waste Management Programs" (Local Government Commission/League of California Cities/California State Association of Counties, May 1992). For the purposes of this discussion, these various options can be grouped into seven general categories:

- Internal financing, directly from the local government's general fund or special fund for capital projects
- General obligation and special revenue bonds
- Municipal lease-purchase programs, including:
  -Single-issue, private-placement lease-purchase agreements,
  -Certificates of Participation,
  -Master leases designed to finance multiple projects, and
  -Line-of-credit leases aimed at financing separate phases of projects;
- Pooled financing and utility partnerships, in which a number of entities are combined under one joint financial authority for economies of scale;
- Energy service companies;
- California Energy Commission loan and technical assistance programs; and
- Federal loans and grants;

- Mortgage programs allied with CHEERS - type programs.

Some of the funding options for energy measures are direct and obvious: loans, rebates, and technical assistance from organizations in the energy business - whether from the federal EPA and the state's Energy Commission or the local utility company and appliance manufacturers.

Other resources for local projects might come from funding for economic development and training-employment programs or from large partnerships between government, businesses, and community groups. Partnerships can also be formed that address separate but interconnected social issues that might be addressed simultaneously with the goal of saving energy. Local programs can be created and funded which blend resources from other "non-energy" avenues, such as economic development funds, business support, employment and educational grants, and community support. Sources of funding and illustrations of program partnerships are included in the analysis of funding for specific measures.

3. CONCLUDING OBSERVATIONS

Energy efficiency can best be achieved when viewed in conjunction with other public policies. Implementation of energy measures should be integrated with implementation programs for transportation, air quality, land use, and other subject areas that are designed to make communities healthier and more functional places to live.

The traditional planning practices within the energy, air quality, transportation, and land-use professions have been, and continue to be, very different. For example, the energy planning profession uses a planning paradigm that requires consumer demand for energy be satisfied. The energy planning process is designed to identify consumer demand and determine the least cost pattern of resource additions to match this demand. Energy planners use Demand-Side Management (DSM) programs to modify consumer demand for energy while meeting energy service requirements.

The air quality planning process is driven by the need to identify feasible control measures to demonstrate attainment of mandated ambient standards without being constrained by quantification of costs and benefits. Transportation has traditionally been facility-oriented, using demand models to determine where congestion could best be minimized through infrastructure additions. Land-use planners attempt to reconcile many economic, social, and environmental objectives; they believe that transportation and land-use planning should be examined simultaneously to produce an integrated approach to urban form, land uses, densities, and facilities.

These different planning paradigms, and emerging changes in planning processes resulting from recent mandates in law, need to be better reconciled in the future to allow effective evaluation of all resource efficiency options. Those with multiple benefits merit high priority evaluation.